HAZARDOUS CHEMICAL & WASTE ANALYSIS

OF THE

BOZEMAN DAILY CHRONICLE

(Meeting OSHA & EPA Requirements)

Presented To

Dr. Wayne Turner

Committee Chairman

By

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IME 570

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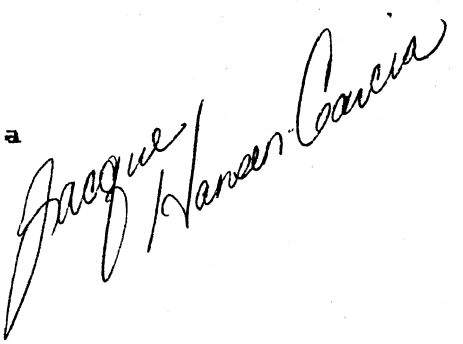

Dr. Turner,

I thank you for
your support & guidance
throughout the past year.
Wishing you great
success and a life filled with
love, happiness!

Affectionately Yours,

Jacque

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ABSTRACT

Federal and state law now requires employers to provide employees access to detailed information on any hazardous chemicals to which they may be exposed. The Bozeman Daily Chronicle uses hazardous chemicals in their photography, print setting, plate making and printing operations. The Occupational Safety and Health Association (OSHA) has adopted the Hazard Communication Standard and Montana has passed the Employee & Community Hazardous Chemical Information Act, both of which govern the use of hazardous chemicals in the workplace.

A hazardous chemical and waste analysis was performed on the Bozeman Daily Chronicle so that a set of compliance guidelines could be established. The following report establishes the guidelines which the Bozeman Daily Chronicle should follow in order to ensure that they are meeting federal and state requirements concerning hazardous chemical use and hazardous waste disposal.

The Bozeman Daily Chronicle was and is presently in compliance with federal and state law concerning waste disposal but various changes, indicated in the guidelines, must be made in order for requirements to be met concerning the safe handling and use of hazardous chemicals. As of May 25, 1986 the Bozeman Daily Chronicle is responsible for complying with federal and state law concerning hazardous communications.

INTRODUCTION

Federal and State Laws

On November 25, 1985 two laws became effective which govern the use of hazardous chemicals in the workplace. The 1985 Montana Legislature passed the "**Employee and Community Hazardous Chemical Information Act**" which is closely tailored to the **Hazard Communication Standard** which was adopted by the Occupational Safety and Health Administration (Refer to Appendix A, pages 12-28 for complete copies of the two laws). Also, in conjunction with safe use of hazardous chemicals, law requires proper disposal of any waste products that are generated from the use of hazardous chemicals.

The Environmental Protection Agency has established outlines for industry to follow in order to help ensure that hazardous waste is properly disposed. The outline established by the EPA incorporates portions of the **Solid Waste Disposal Act,** and the **Clean Air and Water Acts. The Code Of Federal Regulations, Volumes 29, 40 and 49** outline the federal requirements of proper hazardous chemical use and hazardous **waste disposal.**(7,8,9)

Why the Bozeman Daily Chronicle?

The Hazardous Communication Standard requires that any business with one of 20 industrial classifications must adhere to the requirements outlined within the standard. The Bozeman Daily Chronicle has a standard industrial classification of SIC 27

under "Printing and Publishing". The Montana law extends to any employer who employs workers who may be exposed to hazardous chemicals in the workplace. Under federal and state law the Bozeman Daily Chronicle is required by law to provide employees with hazardous chemical information as well as to take precautions to protect worker safety and health. **The Code of Federal Regulations, Volume 40** lists waste products produced by the Bozeman Daily Chronicle, therefore the Bozeman Daily Chronicle must adhere to waste disposal laws also.(8)

Manufacturer Responsibility

In order for employers to comply with federal and state requirements concerning chemical use and waste disposal, the manufacturers of the hazardous chemicals must provide chemical information to the buyers. For the purpose of worker safety and health, the manufacturer of chemicals is obligated to determine if the chemicals are defined as hazardous by the Occupational Safety and Health Administration. Hazardous chemical determination is guided by 4 documents decided on by OSHA. They are CFR 29-1910 (Subpart Z), the Threshold Limit Values, the National Toxicology program list and the International Agency for Research on Cancer.[1]

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1. For details on the 4 documents see reference #4.

Hazardous Chemical & Waste Analysis for the Bozeman Daily Chronicle

In an attempt to help the Bozeman Daily Chronicle comply with federal and state requirements, a hazardous chemical and waste analysis was performed. From the analysis an individualized set of compliance guidelines were then established. The major emphasis was on guidelines for safe use of hazardous chemicals, although consideration was given to hazardous waste generation and disposal.

BODY

Project Approach

The Bozeman Daily Chronicle performs several types of operations daily in order to publish the newspaper. The facility develops a majority of the photographs that are included in the paper. The newspaper print is also typeset and therefore, a photographic processor develops typeset film. Plates used on the printing press are developed using photographic negatives and plate sensitizing chemicals. Lastly, printing operations involve the use of inks and cleaning solvents. In summary, the majority of chemicals used by the Bozeman Daily Chronicle are used for photographic processing and actual newspaper printing. Refer to Appendix A, page 44 for an overview of the four main operational areas within the Bozeman Daily Chronicle.

In order to begin a chemical use and waste analysis the facility's chemicals were first inventoried. Upon determining exactly what chemicals were present, manufacturer information was obtained to determine which workplace chemicals were actually classified as hazardous. Appendix A, pages 45-51 list the chemical products used by the newspaper that are considered hazardous. Once the chemical information was obtained, the guidelines for safe chemical use and proper waste disposal were established.

Compliance Guidelines

Compliance guidelines are being published by a number of businesses in an attempt to aid businesses in establishing guidelines for safe chemical use and proper waste disposal. References 1, 3, 4 and 5 are all publications which outline the requirements of the federal and state laws for safe chemical use. Although the publications were used for reference, the organization and individualization of the compliance guidelines that were put together for the Bozeman Daily Chronicle are those of the analyzer. At this particular point in time, the compliance guidelines established for the Bozeman Daily Chronicle are among the first of their type in the Bozeman area. Original information was not as prevalent as were customized recommendations tailored to the particular characteristics of the business.

Two types of information were necessary for the completion of the compliance guidelines. Under federal and state laws concerning chemical use, employees must have access to information concerning the hazardous chemicals to which they may be exposed. Therefore, employee information binders are provided for employ access. Also, the employer, usually by way of their management, must train the employees on chemical use as well as have complete knowledge of proper procedures they must follow within their daily functions. For these reasons, the Bozeman Daily Chronicle received information for direct use by the employees as well as information for internal business use (Refer to Appendices A and B for details).

Employee Information

The foundation for compliance with the Hazardous Communication Standard is the **Written Hazardous Communication Program** (Refer to Appendix A, pages 29-44 for the actual program). The program establishes guidelines for the employer to follow in order to ensure that employees have access to hazardous chemical information as well as have proper training in chemical use.

Chemical product lists, as well as material safety data sheets, both organized by operational area, are also included in the employee information binders (Refer to Appendix A, pages 45-127 for complete chemical information).

Appendix A also included information that enables the employee to decipher information listed for particular chemicals. The Material Safety Data Sheet Guide is included in the binder so that employees can find out answers to many of the questions that may have concerning particular chemicals. The guide outlines the information contained on the Material Safety Data Sheets (MSDS), as well as includes a glossary of common MSDS terms (Refer to Appendix A, pages 128-157).

A hazardous material identification system (HMIS) is also defined for the employees in order that they understand label and placards that may appear on containers and walls.[1] Appendix A, pages 158-163 define the marking system for the reader as well as provides an example. All the chemicals in the workplace have

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1. See page 159 for details on the HMIS.

been assigned a **HMIS** rating so that workers will understand the degree for health, flammability and reactivity hazard that they are working around (Refer to Appendix A, pages 164-167 for the chemical product HMIS ratings).

Lastly in the employee information binder is a set of work practices for routine and non-routine tasks as well as a set of emergency procedures (Refer to Appendix A, pages 168-186 for the practice and procedure guidelines). These guidelines are available to the employees to help ensure increased worker safety with the handling and use of hazardous chemicals.

Employer Information

There is compliance information concerning chemical use and waste disposal that employees are not legally entitled access to. Such information includes special compliance forms, the employee training outline, community right-to know requirements and U.S. Environmental Protection Agency requirements. Appendix B, pages 188-220, contains all the information just listed above.

Due to the possibility of inspection, liability and employee information request, several compliance forms need be kept by the employer. An employee training log verifies employee training, the contractor acknowledgement log verifies contractor notification and understanding of the chemicals they may be exposed to and employee information forms verify employee requests for chemical information. Appendix B, pages 188-193 contain copies of the special compliance forms.

Federal and state laws require that employers must, at least annually, train their employees on the safe handling and use of the hazardous chemicals in the workplace. Appendix B, pages 194-206 outline the information on which the Bozeman Daily Chronicle should train their employees.

Montana's Employee and Community Hazardous Chemical Information Act requires that the community has access to the chemical list for the Bozeman Daily Chronicle, as well as access to the chemical information listed on the MSDS. Appendix B, pages 207-211 outline the requirements of the Bozeman Daily Chronicle with regard to the Bozeman Community.

Lastly contained in the employer information are the Environmental Protection Agency's hazardous waste disposal requirements. Appendix B, pages 212-220 outline those requirements.

CONCLUSIONS

Overview of the Compliance Guidelines

The compliance guidelines contained in the information provided for the Bozeman Daily Chronicle covers safe use of hazardous chemicals in the workplace as well as proper disposal of waste products generated in the photography, plate making and printing operations. The Bozeman Daily Chronicle must keep abreast on changing federal and state regulations. The compliance guidelines were established according to present laws without anticipation for future changes. Appendices A and B summarize the information that was provided to the Bozeman Daily Chronicle.

Employer Liability and Employee Welfare

The federal and state laws that are presently effective were established to protect human life as well as the surrounding environment. Progress has been slow to enforce the laws due to the monumental task of inspecting and monitoring millions of facilities that use hazardous chemicals as well as generate hazardous waste. The advantage of employee access to chemical information is that of maintaining a check and balance system between worker safety and health, and technological developments that require human participation. Worker safety and health can not be improved merely by way of written compliance guidelines. Both the employer and the employee must take an active interest in the protection of human life and the environment.

APPENDIX A

Bozeman Daily Chronicle's Employee Information

OSHA'S Hazard Communication Standard

FEDERAL HAZARD COMMUNICATION STANDARD

§1910.1200 Hazard communication.

[Sec. 1910.1200 added by 48 FR 53280, November 25, 1983]

(a) *Purpose.* (1) The purpose of this section is to ensure that the hazards of all chemicals produced or imported by chemical manufacturers or importers are evaluated, and that information concerning their hazards is transmitted to affected employers and employees within the manufacturing sector. This transmittal of information is to be accomplished by means of comprehensive hazard communication programs, which are to include container labeling and other forms of warning, material safety data sheets and employee training.

(2) This occupational safety and health standard is intended to address comprehensively the issue of evaluating and communicating chemical hazards to employees in the manufacturing sector, and to preempt any state law pertaining to this subject. Any state which desires to assume responsibility in this area may only do so under the provisions of §18 of the Occupational Safety and Health Act (29 U.S.C. 651 et seq.) which deals with state jurisdiction and state plans.

(b) *Scope and application.* (1) This section requires chemical manufacturers or importers to assess the hazards of chemicals which they produce or import, and all employers in SIC Codes 20 through 39 (Division D, Standard Industrial Classification Manual) to provide information to their employees about the hazardous chemicals to which they are exposed, by means of a hazard communication program, labels and other forms of warning, material safety data sheets, and information and training. In addition, this section requires distributors to transmit the required information to employees in SIC Codes 20-39.

(2) This section applies to any chemical which is known to be present in the workplace in such a manner that employees may be exposed under normal conditions of use or in a foreseeable emergency.

(3) This section applies to laboratories only as follows:

(i) Employers shall ensure that labels on incoming containers of hazardous chemicals are not removed or defaced;

(ii) Employers shall maintain any material safety data sheets that are received with incoming shipments of hazardous chemicals, and ensure that they are readily accessible to laboratory employees; and,

(iii) Employers shall ensure that laboratory employees are apprised of the hazards of the chemicals in their workplaces in accordance with paragraph (h) of this section.

(4) This section does not require labeling of the following chemicals:

(i) Any pesticide as such term is defined in the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. 136 et seq.) when subject to the labeling requirements of that Act and labeling regulations issued under that Act by the Environmental Protection Agency;

(ii) Any food, food additive, color additive, drug, or cosmetic, including materials intended for use as ingredients in such products (e.g., flavors and fragrances), as such terms are defined in the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 301 et seq.) and regulations issued under that Act, when they are subject to the labeling requirements of that Act and labeling regulations issued under that act by the Food and Drug Administration;

(iii) Any distilled spirits (beverage alcohols), wine, or malt beverage intended for non-industrial use, as such terms are defined in the Federal Alcohol Administration Act (27 U.S.C. 201 et seq.) and regulations issued under that Act, when subject to the labeling requirements of that Act and labeling regulations issued under that Act by the Bureau of Alcohol, Tobacco, and Firearms; and,

(iv) Any consumer product or hazardous substance as those terms are defined in the Consumer Product Safety Act (15 U.S.C. 2051 et seq.) and Federal Hazardous Substances Act (15 U.S.C. 1261 et seq.) respectively, when subject to a consumer product safety standard or labeling requirement of those Acts, or regulations issued under those Acts by the Consumer Product Safety Commission.

(5) This section does not apply to:

(i) Any hazardous waste as such term is defined by the Solid Waste disposal Act, as amended by the Resource Conservation and Recovery act of 1976, as amended (42 U.S.C. 6901 et seq.), when subject to regulations issued under that Act by the Environmental Protection Agency;

(ii) Tobacco or tobacco products;

(iii) Wood or wood products;

(iv) Articles; and,

(v)Foods, drugs, or cosmetics intended for personal consumption by employees while in the workplace.

(c) *Definitions.* "Article" means a manufactured item: (i) Which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and (iii) which does not release, or otherwise result in exposure to, a hazardous chemical under normal conditions of use.

"Assistant Secretary" means the Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, or designee.

"Chemical" means any element, chemical compound or mixture of elements and/or compounds.

"Chemical Manufacturer" means an employer in SIC Codes 20 through 39 with a workplace where chemical(s) are produced for use or distribution.

"Chemical name" means the scientific designation of a chemical in accordance with the nomenclature system developed by the International Union of Pure and Applied Chemistry (IUPAC) or the Chemical Abstracts Service (CAS) rules of nomenclature, or a name which will clearly identify the chemical for the purpose of conducting a hazard evaluation.

"Combustible liquid" means any liquid having a flashpoint at or above 100°F (37.8°C), but below 200°F (93.3°C), except any mixture having components with flashpoints of 200°F (93.3°C), or higher, the total volume of which make up 99 percent or more of the total volume of the mixture.

"Common name" means any

designation or identification such as code name, code number, trade name, brand name or generic name used to identify a chemical other than by its chemical name.

"Compressed gas" means:

(i) A gas or mixture of gases having, in a container, an absolute pressure exceeding 40 psi at 70°F (21.1°C); or,

(ii) A gas or mixture of gases having, in a container, an absolute pressure exceeding 104 psi at 130°F (54.4°C) regardless of the pressure at 70°F (21.1°C); or,

(iii) A liquid having a vapor pressure exceeding 40 psi at 100°F (37.8°C) as determined by ASTM D-323-72.

"Container" means any bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank, or the like that contains a hazardous chemical. For purposes of this section, pipes or piping systems are not considered to be containers.

"Designated representative" means any individual or organization to whom an employee gives written authorization to exercise such employee's rights under this section. A recognized or certified collective bargaining agent shall be treated automatically as a designated representative without regard to written employee authorization.

"Director" means the Director, National Institute for Occupational Safety and Health, U.S. Department of Health and Human Services, or designee.

"Distributor" means a business, other than a chemical manufacturer or importer, which supplies hazardous chemicals to other distributors or to manufacturing purchasers.

"Employee" means a worker employed by an employer in a workplace in SIC Codes 20 through 39 who may be exposed to hazardous chemicals under normal operating conditions or foreseeable emergencies, including, but not limited to production workers, line supervisors, and repair or maintenance personnel. Office workers, grounds maintenance personnel, security personnel or non-resident management are generally not included, unless their job performance routinely involves potential exposure to hazardous chemicals.

"Employer" means a person engaged in a business within SIC Codes 20 through 39 where chemicals are either used, or are produced for use or distribution.

"Explosive" means a chemical that causes a sudden, almost instantaneous release of pressure, gas, and heat when subjected to sudden shock, pressure, or high temperature.

"Exposure" or "exposed" means that an employee is subjected to a hazardous chemical in the course of employment through any route of entry (inhalation, ingestion, skin contact or absorption, etc.), and includes potential (e.g., accidental or possible) exposure.

"Flammable" means a chemical that falls into one of the following categories:

(i) "Aerosol, flammable" means an aerosol that, when tested by the method described in 16 CFR 1500.45, yields a flame projection exceeding 18 inches at full valve opening, or a flashback (a flame extending back to the valve) at any degree of valve opening;

(ii) "Gas, flammable" means:

(A) A gas that, at ambient temperature and pressure, forms a flammable mixture with air at a concentration of thirteen (13) percent by volume or less; or,

(B) A gas that, at ambient temperature and pressure, forms a range of flammable mixtures with air wider than twelve (12) percent by volume, regardless of the lower limit;

(iii) "Liquid, flammable" means any liquid having a flashpoint below 100°F (37.8°C), except any mixture having components with flashpoints of 100°F (37.8°C) or higher, the total of which make up 99 percent or more of the total volume of the mixture.

(iv) "Solid, flammable" means a solid, other than a blasting agent or explosive as defined in §1910.109(a), that is liable to cause fire through friction, absorption of moisture, spontaneous chemical change, or retained heat from manufacturing or processing, or which can be ignited readily and when ignited burns so vigorously and persistently as to create a serious hazard. A chemical shall be considered to be a flammable solid if, when tested by the method described in 16 CFR 1500.44, it ignites and burns with a self-sustained flame at a rate greater than one-tenth of an inch per second along its major axis.

"Flashpoint" means the minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite when tested as follows:

(i) Tagliabue Closed Tester (see American National Standard Method of Test for Flash Point by Tag Closed Tester, Z11.24-1979 (ASTM D 56-79)) for liquids with a viscosity of less than 45 Saybolt Universal Seconds (SUS) at 100°F (37.8°C), that do not contain suspended solids and do not have a tendency to form a surface film under test; or,

(ii) Pensky-Martens Closed Tester (see American National Standard Method of Test for Flash Point by Pensky-Martens Closed Tester, Z11.7-1979 (ASTM D 93-79)) for liquids with a viscosity equal to or greater than 45 SUS at 100°F (37.8°C), or that contains suspended solids, or that have a tendency to form a surface film under test; or,

(iii) Setaflash Closed Tester (see American National Standard Method of Test for Flash Point by Setaflash Closed Tester (ASTM D 3278-78)). Organic peroxides, which undergo autoaccelerating thermal decomposition, are excluded from any of the flashpoint determination methods specified above.

"Foreseeable emergency" means any potential occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment which could result in an uncontrolled release of a hazardous chemical into the workplace.

"Hazard warning" means any words, pictures, symbols, or combination thereof appearing on a label or other appropriate form of warning which convey the hazards of the chemical(s) in the container(s).

"Hazardous chemical" means any chemical which is a physical hazard or a health hazard.

"Health hazard" means a chemical for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. The term "health hazard" includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic system, and agents which damage the lungs, skin, eyes, or mucous membranes. Appendix A provides further definitions and explanations of the scope

of health hazards covered by this section, and Appendix B describes the criteria to be used to determine whether or not a chemical is to be considered hazardous for purposes of this standard.

"Identity" means any chemical or common name which is indicated on the material safety data sheet (MSDS) for the chemical. The identity used shall permit cross-references to be made among the required list of hazardous chemicals, the label and the MSDS.

"Immediate use" means that the hazardous chemical will be under the control of and used only by the person who transfers it from a labeled container and only within the work shift in which it is transferred.

"Importer" means the first business with employees within the Customs Territory of the United States which receives hazardous chemicals produced in other countries for the purpose of supplying them to distributors or manufacturing purchasers within the United States.

"Label" means any written, printed, or graphic material displayed on or affixed to containers of hazardous chemicals.

"Manufacturing purchaser" means an employer with a workplace classified in SIC Codes 20 through 39 who purchases a hazardous chemical for use within that workplace.

"Material safety data sheet (MSDS)" means written or printed material concerning a hazardous chemical which is prepared in accordance with paragraph (g) of this section.

"Mixture" means any combination of two or more chemicals if the combination is not , in whole or in part, the result of a chemical reaction.

"Organic peroxide" means an organic compound that contains the bivalent -O-O-structure and which may be considered to be a structural derivative of hydrogen peroxide where one or both of the hydrogen atoms has been replaced by an organic radical.

"Oxidizer" means a chemical other than a blasting agent or explosive as defined in §1910.109(a), that initiates or promotes combustion in other materials, thereby causing fire either of itself or through the release of oxygen or other gases.

"Physical hazard" means a chemical for which there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable (reactive) or water-reactive.

"Produce" means to manufacture, process, formulate, or repackage.

"Pyrophoric" means a chemical that will ignite spontaneously in air at a temperature of 130°F (54.4°C) or below.

"Responsible party" means someone who can provide additional information on the hazardous chemical and appropriate emergency procedures, if necessary.

"Specific chemical identity" means the chemical name, Chemical Abstracts Service (CAS) Registry Number, or any other information that reveals the precise chemical designation of the substance.

"Trade secret" means any confidential formula, pattern, process, device, information or compilation of information (including chemical name or other unique chemical identifier) that is used in an employer's business, and that gives the employer an opportunity to obtain an advantage over competitors who do not know or use it.

"Unstable (reactive)" means a chemical which in the pure state, or as produced or transported, will vigorously polymerize, decompose, condense, or will become self-reactive under conditions of shock, pressure, or temperature.

"Use" means to package, handle, react, or transfer.

"Water-reactive" means a chemical that reacts with water to release a gas that is either flammable or presents a health hazard.

"Work area" means a room or defined space in a workplace where hazardous chemicals are produced or used, and where employees are present.

"Workplace" means an establishment at one geographical location containing one or more work areas.

(d) *Hazard determination.* (1) Chemical manufacturers and importers shall evaluate chemicals produced in their workplaces or imported by them to determine if they are hazardous. Employers are not required to evaluate chemicals unless they choose not to rely on the evaluation performed by the chemical manufacturer or importer for the chemical to satisfy this requirement.

(2) Chemical manufacturers, importers or employers evaluating chemicals shall identify and consider the available scientific evidence concerning such hazards. For health hazards, evidence which is statistically significant and which is based on at least one positive study conducted in accordance with established scientific principles is considered to be sufficient to establish a hazardous effect if the results of the study meet the definitions of health hazards in this section. Appendix A shall be consulted for the scope of health hazards covered, and Appendix B shall be consulted for the criteria to be followed with respect to the completeness of the evaluation, and the data to be reported.

(3) The chemical manufacturer, importer or employer evaluating chemicals shall treat the following sources as establishing that the chemicals listed in them are hazardous:

(i) 29 CFR Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA); or,

(ii) *Threshold Limit Values for Chemical Substances and Physical Agents in the Work Environment*, American Conference of Governmental Industrial Hygienists (ACGIH) (latest edition).

The chemical manufacturer, importer, or employer is still responsible for evaluating the hazards associated with the chemicals in these source lists in accordance with the requirements of the standard.

(4) Chemical manufacturers, importers and employers evaluating chemicals shall treat the following sources as establishing that a chemical is a carcinogen or potential carcinogen for hazard communication purposes:

(i) National Toxicology Program (NTP), *Annual Report on Carcinogens* (latest edition); or,

(ii) International Agency for Research on Cancer (IARC), *Monographs* (latest edition); or,

(iii) 29 CFR Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA).

Note.—*The Registry of Toxic Effects of Chemical Substances* published by the National Institute for Occupational Safety

and Health (NIOSH) indicates whether a chemical has been found by NTP or IARC to be a potential carcinogen.

(5) The chemical manufacturer, importer or employer shall determine the hazards of mixtures of chemicals as follows:

(i) If a mixture has been tested as a whole to determine its hazards, the results of such testing shall be used to determine whether the mixture is hazardous;

(ii) If a mixture has not been tested as a whole to determine whether the mixture is a health hazard, the mixture shall be assumed to present the same health hazards as do the components which comprise one percent (by weight or volume) or greater of the mixture, except that the mixture shall be assumed to present a carcinogenic hazard if it contains a component in concentrations of 0.1 percent or greater which is considered to be a carcinogen under paragraph (d)(4) of this section;

(iii) If a mixture has not been tested as a whole to determine whether the mixture is a physical hazard, the chemical manufacturer, importer, or employer may use whatever scientifically valid data is available to evaluate the physical hazard potential of the mixture; and,

(iv) If the employer has evidence to indicate that a component present in the mixture in concentrations of less than one percent (or in the case of carcinogens, less than 0.1 percent) could be released in concentrations which would exceed an established OSHA permissible exposure limit or ACGIH Threshold Limit Value, or could present a health hazard to employees in those concentrations, the mixture shall be assumed to present the same hazard.

(6) Chemical manufacturers, importers, or employers evaluating chemicals shall describe in writing the procedures they use to determine the hazards of the chemical they evaluate. The written procedures are to be made available, upon request, to employees, their designated representatives, the Assistant Secretary and the Director. The written description may be incorporated into the written hazard communication program required under paragraph (e) of this section.

(e) *Written hazard communication program.* (1) Employers shall develop and implement a written hazard communication program for their workplace which at least describes how the criteria specified in paragraphs (f), (g), and (h) of this section for labels and other forms of warning, material safety data sheets, and employee information and training will be met, and which also includes the following:

(i) A list of the hazardous chemicals known to be present using an identity that is referenced on the appropriate material safety data sheet (the list may be compiled for the workplace as a whole or for individual work areas);

(ii) The methods the employer will use to inform employees of the hazards of non-routine tasks (for example, the cleaning of reactor vessels), and the hazards associated with chemicals contained in unlabeled pipes in their work areas; and,

(iii) The methods the employer will use to inform any contractor employers with employees working in the employer's workplace of the hazardous chemicals their employees may be exposed to while performing their work, and any suggestions for appropriate protective measures.

(2) The employer may rely on an existing hazard communication program to comply with these requirements, provided that it meets the criteria established in this paragraph (e).

(3) The employer shall make the written hazard communication program available, upon request, to employees, their designated representatives, the Assistant Secretary and the Director, in accordance with the requirements of 29 CFR 1910.20(e).

(f) *Labels and other forms of warning.* (1) The chemical manufacturer, importer, or distributor shall ensure that each container of hazardous chemicals leaving the workplace is labeled, tagged or marked with the following information:

(i) Identity of the hazardous chemical(s);

(ii) Appropriate hazard warnings; and,

(iii) Name and address of the chemical manufacturer, importer, or other responsible party.

(2) Chemical manufacturers, importers, or distributors shall ensure that each container of hazardous chemicals leaving the workplace is labeled, tagged, or marked in accordance with this section in a manner which does not conflict with the requirements of the Hazardous Materials Transportation Act (18 U.S.C. 1801 et seq.) and regulations issued under that Act by the Department of Transportation.

(3) If the hazardous chemical is regulated by OSHA in a substance-specific health standard, the chemical manufacturer, importer, distributor or employer shall ensure that the labels or other forms of warning used are in accordance with the requirements of that standard.

(4) Except as provided in paragraphs (f)(5) and (f)(6) the employer shall ensure that each container of hazardous chemicals in the workplace is labeled, tagged, or marked with the following information:

(i) Identity of the hazardous chemical(s) contained therein; and,

(ii) Appropriate hazard warnings.

(5) The employer may use signs, placards, process sheets, batch tickets, operating procedures or other such written materials in lieu of affixing labels to individual stationary process containers, as long as the alternative method identifies the containers to which it is applicable and conveys the information required by paragraph (f)(4) of this section to be on a label. The written materials shall be readily accessible to the employees in their work area throughout each work shift.

(6) The employer is not required to label portable containers into which hazardous chemicals are transferred from labeled containers, and which are intended only for the immediate use of the employee who performs the transfer.

(7) The employer shall not remove or deface existing labels on incoming containers of hazardous chemicals, unless the container is immediately marked with the required information.

(8) The employer shall ensure that labels or other forms of warning are legible, in English, and prominently displayed on the container, or readily available in the work area throughout each work shift. Employers having employees who speak other languages may add the information in their

language to the material presented, as long as the information is presented in English as well.

(9) The chemical manufacturer, importer, distributor or employer need not affix new labels to comply with this section if existing labels already convey the required information.

(g) *Material safety data sheets.* (1) Chemical manufacturers and importers shall obtain or develop a material safety data sheet for each hazardous chemical they produce or import. Employers shall have a material safety data sheet for each hazardous chemical which they use.

(2)Each material safety data sheet shall be in English and shall contain at least the following information:

(i) The identity used on the label, and, except as provided for in paragraph (f) of this section on trade secrets:

(A) If the hazardous chemical is a single substance, its chemical and common name(s);

(B) If the hazardous chemical is a mixture which has been tested as a whole to determine its hazards, the chemical and common name(s) of the ingredients which contribute to these known hazards, and the common name(s) of the mixture itself; or,

(C) If the hazardous chemical is a mixture which has not been tested as a whole:

(1) The chemical and common name(s) of all ingredients which have been determined to be health hazards, and which comprise 1% or greater of the composition, except that chemicals identified as carcinogens under paragraph (d)(4) of this section shall be listed if the concentrations are 0.1% or greater; and,

(2) The chemical and common name(s) of all ingredients which have been determined to present a physical hazard when present in the mixture;

(ii) Physical and chemical characteristics of the hazardous chemical (such as vapor pressure, flash point);

(iii) The physical hazards of the hazardous chemical, including the potential for fire, explosion, and reactivity;

(iv) The health hazards of the hazardous chemical, including signs and symptoms of exposure, and any medical conditions which are generally recognized as being aggravated by exposure to the chemical;

(v) The primary route(s) of entry;

(vi) The OSHA permissible exposure limit, ACGIH threshold limit value, and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the material safety data sheet, where available;

(vii) Whether the hazardous chemical is listed in the National Toxicology Program (NTP) *Annual Report on Carcinogens* (latest edition) or has been found to be a potential carcinogen in the International Agency for Research on Cancer (IARC) *Monographs* (latest edition), or by OSHA;

(viii) Any generally applicable precautions for safe handling and use which are known to the chemical manufacturer, importer or employer preparing the material safety data sheet, including appropriate hygienic practices, protective measures during repair and maintenance of contaminated equipment, and procedures for clean-up of spills and leaks;

(ix) Any generally applicable control measures which are known to the chemical manufacturer, importer or employer preparing the material safety data sheet, such as appropriate engineering controls, work practices, or personal protective equipment;

(x) Emergency and first aid procedures;

(xi) The date of preparation of the material safety data sheet or the last change to it; and,

(xii) The name, address and telephone number of the chemical manufacturer, importer, employer or other responsible party preparing or distributing the material safety data sheet, who can provide additional information on the hazardous chemical and appropriate emergency procedures, if necessary.

(3) If no relevant information is found for any given category on the material safety data sheet, the chemical manufacturer, importer or employer preparing the material safety data sheet shall mark it to indicate that no applicable information was found.

(4) Where complex mixtures have similar hazards and contents (i.e., the chemical ingredients are essentially the same, but the specific composition varies from mixture to mixture), the chemical manufacturer, importer or employer may prepare one material safety data sheet to apply to all of these similar mixtures.

(5) The chemical manufacturer, importer or employer preparing the material safety data sheet shall ensure that the information is recorded accurately and reflects the scientific evidence used in making the hazard determination. If the chemical manufacturer, importer or employer becomes newly aware of any significant information regarding the hazards of a chemical, or ways to protect against the hazards, this new information shall be added to the material safety data sheet within three months. If the chemical is not currently being produced or imported the chemical manufacturer or importer shall add the information to the material safety data sheet before the chemical is introduced into the workplace again.

(6) Chemical manufacturers or importers shall ensure that distributors and manufacturing purchasers of hazardous chemicals are provided an appropriate material safety data sheet with their initial shipment, and with the first shipment after a material safety data sheet is updated. The chemical manufacturer or importer shall either provide material safety data sheets with the shipped containers or send them to the manufacturing purchaser prior to or at the time of the shipment. If the material safety data sheet is not provided with the shipment, the manufacturing purchaser shall obtain one from the chemical manufacturer, importer, or distributor as soon as possible.

(7) Distributors shall ensure that material safety data sheets, and updated information, are provided to other distributors and manufacturing purchasers of hazardous chemicals.

(8) The employer shall maintain copies of the required material safety data sheets for each hazardous chemical in the workplace, and shall ensure that they are readily accessible during each work shift to employees when they are in their work area(s).

(9) Material safety data sheets may be kept in any form, including operating procedures, and may be designed to cover groups of hazardous chemicals in a work area where it may be more appropriate to address the hazards of a process rather than individual hazardous chemicals. However, the employer shall ensure that

in all cases the required information is provided for each hazardous chemical, and is readily accessible during each work shift to employees when they are in the work area(s).

(10) Material safety data sheets shall also be made readily available, upon request, to designated repesentatives and to the Assistant Secretary, in accordance with the requirements of 29 CFR 1910.20(e). The Director shall also be given access to material safety data sheets in the same manner.

(h) *Employee information and training.* Employers shall provide employees with information and training on hazardous chemicals in their work area at the time of their initial assignment, and whenever a new hazard is introduced into their work area.

(1) *Information.* Employees shall be informed of:

(i) The requirements of this section;

(ii) Any operations in their work area where hazardous chemicals are present; and,

(iii) The location and availability of the written hazard communication program, including the required list(s) of hazardous chemicals, and material safety data sheets required by this section.

(2) *Training.* Employee training shall include at least:

(i) Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area (such as monitoring conducted by the employer, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.);

(ii) The physical and health hazards of the chemicals in the work area;

(iii) The measures employees can take to protect themselves from these hazards, including specific procedures the employer has implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used; and,

(iv) The details of the hazard communication program developed by the employer, including an explanation of the labeling system and the material safety data sheet, and how employees can obtain and use the appropriate hazard information.

(i) *Trade secrets.* The chemical manufacturer, importer or employer may withhold the specific chemical identity, including the chemical name and other specific identification of a hazardous chemical, from the material safety data sheet, provided that:

(i) The claim that the information withheld is a trade secret can be supported;

(ii) Information contained in the material safety data sheet concerning the properties and effects of the hazardous chemical is disclosed;

(iii) The material safety data sheet indicates that the specific chemical identity is being withheld as a trade secret; and,

(iv) The specific chemical identity is made available to health professionals, in accordance with the applicable provisions of this paragraph.

(2) Where a treating physician or nurse determines that a medical emergency exists and the specific chemical identity of a hazardous chemical is necessary for emergency or first-aid treatment, the chemical manufacturer, importer, or employer shall immediately disclose the specific chemical identity of a trade secret chemical to that treating physician or nurse, regardless of the existence of a written statement of need or a confidentiality agreement. The chemical manufacturer, importer, or employer may require a written statement of need and confidentiality agreement, in accordance with the provisions of paragraphs (i)(3) and (4) of this section, as soon as circumstances permit.

(3) In non-emergency situations, a chemical manufacturer, importer, or employer shall, upon request, disclose a specific chemical identity, otherwise permitted to be withheld under paragraph (i)(1) of this section, to a health professional (i.e., physician, industrial hygienist, toxicologist, or epidemiologist) providing medical or other occupational health services to exposed employee(s) if:

(i) The request is in writing;

(ii) The request describes with reasonable detail one or more of the following occupational health needs for the information:

(A) To assess the hazards of the chemicals to which employees will be exposed;

(B) To conduct or assess sampling of the workplace atmosphere to determine employee exposure levels;

(C) To conduct pre-assignment or periodic medical surveillance of exposed employees;

(D) To provide medical treatment to exposed employees;

(E) To select or assess appropriate personal protective equipment for exposed employees;

(F) To design or assess engineering controls or other protective measures for exposed employees; and,

(G) To conduct studies to determine the health effects of exposure.

(iii) The request explains in detail why the disclosure of the specific chemical identity is essential and that, in lieu thereof, the disclosure of the following information would not enable the health professional to provide the occupational health services described in paragraph (ii) of this section:

(A) The properties and effects of the chemical;

(B) Measures for controlling workers' exposure to the chemical;

(C) Methods of monitoring and analyzing worker exposure to the chemical; and,

(D) Methods of diagnosing and treating harmful exposures to the chemical.

(iv) The request includes a description of the procedures to be used to maintain the confidentiality of the disclosed information; and,

(v) The health professional, and the employer or contractor of the health professional's services (i.e., downstream employer, labor organization, or individual employer), agree in a written confidentiality agreement that the health professional will not use the trade secret information for any purpose other than the health need(s) asserted and agree not to release the information under any circumstances other than to OSHA, as provided in paragraph (i)(6) of this section, except as authorized by the terms of the agreement or by the chemical manufacturer, importer, or employer.

(4) The confidentiality agreement authorized by paragraph (i)(3)(iv) of this section:

(i) May restrict the use of the information to the health purposes

indicated in the written statement of need;

(ii) May provide for appropriate legal remedies in the event of a breach of the agreement, including stipulation of a reasonable pre-estimate of likely damages; and,

(iii) May not include requirements for the posting of a penalty bond.

(5) Nothing in this standard is meant to preclude the parties from pursuing non-contractual remedies to the extent permitted by law.

(6) If the health professional receiving the trade secret information decides that there is a need to disclose it to OSHA, the chemical manufacturer, importer, or employer who provided the information shall be informed by the health professional prior to, or at the same time as, such disclosure.

(7) If the chemical manufacturer, importer, or employer denies a written request for disclosure of a specific chemical identity, the denial must:

(i) Be provided to the health professional within thirty days of the request;

(ii) Be in writing;

(iii) Include evidence to support the claim that the specific chemical identity is a trade secret;

(iv) State the specific reasons why the request is being denied; and,

(v) Explain in detail how alternative information may satisfy the specific medical or occupational health need without revealing the specific chemical identity.

(8) The health professional whose request for information is denied under paragraph (i)(3) of this section may refer the request and the written denial of the request to OSHA for consideration.

(9) When a health professional refers the denial to OSHA under paragraph (i)(8) of this section, OSHA shall consider the evidence to determine if:

(i) The chemical manufacturer, importer, or employer has supported the claim that the specific chemical identity is a trade secret;

(ii) The health professional has supported the claim that there is a medical or occupational health need for the information; and,

(iii) The health professional has demonstrated adequate means to protect the confidentiality.

(10) (i) If OSHA determines that the specific chemical identity requested under paragraph (i)(3) of this section is not a *bona fide* trade secret, or that it is a trade secret but the requesting health professional has a legitimate medical or occupational health need for the information, has executed a written confidentiality agreement, and has shown adequate means to protect the confidentiality of the information, the chemical manufacturer, importer, or employer will be subjected to citation by OSHA.

(ii) If a chemical manufacturer, importer, or employer demonstrates to OSHA that the execution of a confidentiality agreement would not provide sufficient protection against the potential harm from the unauthorized disclosure of a trade secret specific chemical identity, the Assistant Secretary may issue such orders or impose such additional limitations or conditions upon the disclosure of the requested chemical information as may be appropriate to assure that the occupational health services are provided without an undue risk of harm to the chemical manufacturer, importer, or employer.

(11) If, following the issuance of a citation and any protective orders, the chemical manufacturer, importer, or employer continues to withhold the information, the matter is referrable to the Occupational Safety and Health Review Commission for enforcement of the citation. In accordance with Commission rules, the Administrative Law Judge may review the citation and supporting documentation *in camera* or issue appropriate protective orders.

(12) Notwithstanding the existence of a trade secret claim, a chemical manufacturer, importer, or employer shall, upon request, disclose to the Assistant Secretary any information which this section requires the chemical manufacturer, importer, or employer to make available. Where there is a trade secret claim, such claim shall be made no later than at the time the information is provided to the Assistant Secretary so that suitable determinations of trade secret status can be made and the necessary protections can be implemented.

(13) Nothing in this paragraph shall be construed as requiring the disclosure under any circumstances of process or percentage of mixture information which is trade secret.

(j) *Effective dates.* Employers shall be in compliance with this section within the following periods:

(1) Chemical manufacturers and importers shall label containers of hazardous chemicals leaving their workplaces, and provide material safety data sheets with initial shipments by November 25, 1985.

(2) Distributors shall be in compliance with all provisions of this section applicable to them by November 25, 1985.

(3) Employers shall be in compliance with all provisions of this section by May 25, 1986, including initial training for all current employees.

Appendix A to §1910.1200—Health Hazard Definitions (Mandatory)

Although safety hazards related to the physical characteristics of a chemical can be objectively defined in terms of testing requirements (e.g., flammability), health hazard definitions are less precise and more subjective. Health hazards may cause measurable changes in the body—such as decreased pulmonary function. These changes are generally indicated by the occurrence of signs and symptoms in the exposed employees—such as shortness of breath, a non-measurable, subjective feeling. Employees exposed to such hazards must be apprised of both the change in body function and the signs and symptoms that may occur to signal that change.

The determination of occupational health hazards is complicated by the fact that many of the effects or signs and symptoms occur commonly in non-occupationally exposed populations, so that effects of exposure are difficult to separate from normally occurring illnesses. Occasionally, a substance causes an effect that is rarely seen in the population at large, such as angiosarcomas caused by vinyl chloride exposure, thus making it easier to ascertain that the occupational exposure was the primary causative factor. More often, however, the effects are common, such as lung cancer. The situation is further complicated by the fact that most

chemicals have not been adequately tested to determine their health hazard potential, and data do not exist to substantiate these effects.

There have been many attempts to categorize effects and to define them in various ways. Generally, the terms "acute" and "chronic" are used to delineate between effects on the basis of severity or duration. "Acute" effects usually occur rapidly as a result of short-term exposures, and are of short duration. "Chronic" effects generally occur as a result of long-term exposure, and are of long duration.

The acute effects referred to most frequently are those defined by the American National Standards Institute (ANSI) standard for Precautionary Labeling of Hazardous Industrial Chemicals (Z129.1-1982)—irritation, corrosivity, sensitization and lethal dose. Although these are important health effects, they do not adequately cover the considerable range of acute effects which may occur as a result of occupational exposures, such as, for example, narcosis.

Similarly, the term chronic effect is often used to cover only carcinogenicity, teratogenicity, and mutagenicity. These effects are obviously a concern in the workplace, but again, do not adequately cover the area of chronic effects, excluding, for example, blood dyscrasias (such as anemia), chronic bronchitis and liver atrophy.

The goal of defining precisely, in measurable terms, every possible health effect that may occur in the workplace as a result of chemical exposures cannot realistically be accomplished. This does not negate the need for employees to be informed of such effects and protected from them.

Appendix B, which is also mandatory, outlines the principles and procedures of hazard assessment.

For purposes of this section, any chemicals which meet any of the following definitions, as determined by the criteria set forth in Appendix B, are health hazards:

1. *Carcinogen:* A chemical is considered to be a carcinogen if:

(a) It has been evaluated by the International Agency for Research on Cancer (IARC), and found to be a carcinogen or potential carcinogen; or,

(b) It is listed as a carcinogen or potential carcinogen in the *Annual Report on Carcinogens* published by the National Toxicology Program (NTP) (latest edition); or,

(c) It is regulated by OSHA as a carcinogen.

2. *Corrosive:* A chemical that causes visible destruction of, or irreversible alterations in, living tissue by chemical action at the site of contact. For example, a chemical is considered to be corrosive if, when tested on the intact skin of albino rabbits by the method described by the U.S. Department of Transportation in Appendix A to 49 CFR Part 173, it destroys or changes irreversibly the structure of the tissue at the site of contact following an exposure period of four hours. This term shall not refer to action on inanimate surfaces.

3. *Highly toxic:* A chemical falling within any of the following categories:

(a) A chemical that has a median lethal dose (LD_{50}) of 50 milligrams or less per kilogram of body weight when administered orally to albino rats weighing between 200 and 300 grams each.

(b) A chemical that has a median lethal dose (LD_{50}) of 200 milligrams or less per kilogram of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between two and three kilograms each.

(c) A chemical that has a median lethal concentration (LC_{50}) in air of 200 parts per million by volume or less of gas or vapor, or 2 milligrams per liter or less of mist, fume, or dust, when administered by continuous inhalation for one hour (or less if death occurs within one hour) to albino rats weighing between 200 and 300 grams each.

4. *Irritant:* A chemical, which is not corrosive, but which causes a reversible inflammatory effect on living tissue by chemical action at the site of contact. A chemical is a skin irritant if, when tested on the intact skin of albino rabbits by the methods of 16 CFR 1500.41 for four hours exposure or by other appropriate techniques, it results in an empirical score of five or more. A chemical is an eye irritant if so determined under the procedure listed in 16 CFR 1500.42 or other appropriate techniques.

5. *Sensitizer:* A chemical that causes a substantial proportion of exposed people or animals to develop an allergic reaction in normal tissue after repeated exposure to the chemical.

6. *Toxic:* A chemical falling within any of the following categories:

(a) A chemical that has a median lethal dose (LD_{50}) of more than 50 milligrams per kilogram but not more than 500 milligrams per kilogram of body weight when administered orally to albino rats weighing between 200 and 300 grams each.

(b) A chemical that has a median lethal dose (LD_{50}) of more than 200 milligrams per kilogram but not more than 1,000 milligrams per kilogram of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between two and three kilograms each.

(c) A chemical that has a median lethal concentration (LC_{50}) in air of more than 200 parts per million but not more than 2,000 parts per million by volume of gas or vapor, or more than two milligrams per liter but not more than 20 milligrams per liter of mist, fume, or dust, when administered by continuous inhalation for one hour (or less if death occurs within one hour) to albino rats weighing between 200 and 300 grams each.

7. *Target organ effects.* The following is a target organ categorization of effects which may occur, including examples of signs and symptoms and chemicals which have been found to cause such effects. These examples are presented to illustrate the range and diversity of effects and hazards found in the workplace, and the broad scope employers must consider in this area, but are not intended to be all-inclusive.

a.	Hepatotoxins:	Chemicals which produce liver damage.
	Signs and Symptoms:	Jaundice; liver enlargement.
	Chemicals:	Carbon tetrachloride; nitrosamines.
b.	Nephrotoxins:	Chemicals which produce kidney damage.
	Signs and Symptoms:	Edema; proteinuria
	Chemicals:	Halogenated hydrocarbons; uranium.
c.	Neurotoxins:	Chemicals which produce their primary toxic effects on the nervous system.
	Signs and Symptoms:	Narcosis; behavioral changes; decrease in motor functions.
	Chemicals:	Mercury; carbon disulfide
d.	Agents which act on the blood or hematopoietic system:	Decrease hemoglobin function; deprive the body tissues of oxygen.
	Signs and Symptoms:	Cyanosis; loss of consciousness.
	Chemicals:	Carbon monoxide; cyanides.
e.	Agents which damage the lung:	Chemicals which irritate or damage the pulmonary tissue.
	Signs and Symptoms:	Cough; tightness in chest; shortness of breath.
	Chemicals:	Silica; asbestos.
f.	Reproductive toxins:	Chemicals which affect the reproductive capabilities including chromosomal damage (mutations) and effects on fetuses (teratogenesis).
	Signs and Symptoms:	Birth defects; sterility.
	Chemicals:	Lead; DBCP.
g.	Cutaneous hazards:	Chemicals which affect the dermal layer of the body.
	Signs and Symptoms:	Defatting of the skin; rashes; irritation.
	Chemicals:	Ketones; chlorinated compounds.
h.	Eye hazards:	Chemicals which affect the eye or visual capacity.
	Signs and Symptoms:	Conjunctivitis; corneal damage.
	Chemicals:	Organic solvents; acids.

Appendix B to §1900.1200—Hazard Determination (Mandatory)

The quality of a hazard communication program is largely dependent upon the adequacy and accuracy of the hazard determination. The hazard determination requirement of this standard is performance-oriented. Chemical manufacturers, importers, and employers evaluating chemicals are not required to follow any specific methods for determining hazards, but they must be able to demonstrate that they have adequately ascertained the hazards of the chemicals produced or imported in accordance with the criteria set forth in this Appendix.

Hazard evaluation is a process which relies heavily on the professional judgment of the evaluator, particularly in the area of chronic hazards. The performance-orientation of the hazard determination does not diminish the duty of the chemical manufacturer, importer, or employer to conduct a thorough evaluation, examining all relevant data and producing a scientifically defensible evaluation. For purposes of this standard, the following criteria shall be used in making hazard determinations that meet the requirements of this standard.

1. *Carcinogenicity:* As described in paragraph (d)(4) and Appendix A of this section, a determination by the National Toxicology Program, the International Agency for Research on Cancer, or OSHA that a chemical is a carcinogen or potential carcinogen will be considered conclusive evidence for purposes of this section.

2. *Human data:* Where available, epidemiological studies and case reports of adverse health effects shall be considered in the evaluation.

3. *Animal data:* Human evidence of health effects in exposed populations is generally not available for the majority of chemicals produced or used in the workplace. Therefore, the available results of toxicological testing in animal populations shall be used to predict the health effects that may be experienced by exposed workers. In particular, the definitions of certain acute hazards refer to specific animal testing results (see Appendix A).

4. *Adequacy and reporting of data:* The results of any studies which are designed and conducted according to established scientific principals, and which report statistically significant conclusions regarding the health effects of a chemical, shall be a sufficient basis for a hazard determination and reported on any material safety data sheet. The chemical manufacturer, importer, or employer may also report the results of other scientifically valid studies which tend to refute the findings of hazard.

Appendix C to §1900.1200—Information Sources (Advisory)

The following is a list of available data sources which the chemical manufacturer, importer, or employer may wish to consult to evaluate the hazards of chemicals they produce or import:

—Any information in their own company files such as toxicity testing results or illness experience of company employees.

—Any information obtained from the supplier of the chemical, such as material safety data sheets or product safety bulletins.

—Any pertinent information obtained from the following source list (latest editions) should be used:

Condensed Chemical Dictionary
Van Nostrand Reinhold Co., 135 West 50th Street, New York, NY 10020

The Merck Index; An Encyclopedia of Chemicals and Drugs
Merck and Company, Inc., 126 E. Lincoln Avenue, Rahway, NJ 07065

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man
Geneva: World Health Organization, International Agency for Research on Cancer, 1972-1977. (Multivolume work), 49 Sheridan Street, Albany, New York

Industrial Hygiene and Toxicology, by F. A. Patty
John Wiley & Sons, Inc., New York, NY (Five volumes)

Clinical Toxicology of Commercial Products
Gleason, Gosselin and Hodge

Casarett and Doull's Toxicology; The Basic Science of Poisons
Doull, Klassen and Amdur, Macmillan Publishing Co., Inc., New York, NY

Industrial Toxicology, by Alice Hamilton and Harriet L. Hardy
Publishing Sciences Group, Inc., Acton, MA

Toxicology of the Eye, by W. Morton Grant
Charles C. Thomas, 301-327 East Lawrence Avenue, Springfield, IL

Recognition of Health Hazards in Industry by William A. Burgess
John Wiley and Sons, 605 Third Avenue, New York,

Chemical Hazards of the Workplace by Nick H. Proctor and James P. Hughes
J. P. Lipincott Company, 6 Winchester Terrace, New York, NY 10022

Handbook of Chemistry and Physics
Chemical Rubber Company, 18901 Cranwood Parkway, Cleveland, OH 44128

Threshold Limit Values for Chemical Substances and Physical Agents in the Workroom Environment with Intended Changes
American Conference of Governmental Industrial Hygienists, 6500 Glenway Avenue, Bldg. D-5, Cincinnati, OH 45211

Note—The following documents are on sale by the Superintendant of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Occupational Health Guidelines
NIOSH/OSHA (NIOSH Pub. No. 81-123)

NIOSH/OSHA Pocket Guide to Chemical Substances
NIOSH Pub. No. 78-210

Registry of Toxic Effects of Chemical Substances
U.S. Department of Health and Human Services, Public Health Service, Center for Disease Control, National Institute for Occupational Safety and Health (NIOSH Pub. No. 80-102)

The Industrial Environment—Its Evaluation and Control
U.S. Department of Health and Human Services, Public Health Service, Center for Disease Control, National Institute for Occupational Safety and Health (NIOSH Pub. No. 74-117)

Miscellaneous Documents—National Institute for Occupational Safety and Health
1. Criteria for a recommended standard • • • Occupational Exposure to "----"
2. Special Hazard Reviews
3. Occupational Hazard Assessment
4. Current Intelligence Bulletins

Bibliographic Data Bases

Service Provider and File Name

Bibliographic Retrieval Services (BRS), Corporation Park, Bldg. 702, Scotia, New York 12302
AGRICOLA
BIOSIS PREVIEWS
CA CONDENSATES
CA SEARCH
DRUG INFORMATION
MEDLARS
MEDLOC
NTIS
POLLUTION ABSTRACTS
SCIENCE CITATION INDEX
SSIE

Lockheed—DIALOG, Lockheed Missiles & Space Company, Inc., P.O. Box 44481, San Francisco, CA 94144
AGRICOLA
BIOSIS PREV. 1972-PRESENT
BIOSIS PREV. 1969-71
CA CONDENSATES 1970-71
CA SEARCH 1972-76
CA SEARCH 1977-PRESENT
CHEMNAME
CONFERENCE PAPERS INDEX
FOOD SCIENCE & TECH. ABSTR.
FOODS ADLIBRA
INTL. PHARMACEUTICAL ABSTR.
NTIS
POLLUTION ABSTRACTS
SCISEARCH 1978-PRESENT
SCISEARCH 1974-77
SSIE CURRENT RESEARCH

SDC—ORBIT, SDC Search Service, Department No. 2230, Pasadena, CA 91051
AGRICOLA
BIOCODES
BIOSIS/BIO6973
CAS6771/CAS7276
CAS77
CHEMDEX
CONFERENCE
ENVIROLINE
LABORDOC
NTIS
POLLUTION
SSIE

Chemical Information System (CIS), Chemical Information Systems, Inc., 7215 York Road, Baltimore, MD 21212
Structure & Nomenclature Search System
Acute Toxicity (RTECS)
Clinical Toxicology of Commercial Products
Oil and Hazardous Materials Technical Assistance Data System

National Library of Medicine, Department of Health and Human Services, Public Health Service, National Institutes of Health, Bethesda, MD 20209
Toxicology Data Bank (TDB)
MEDLIN
TOXLINE
CANCERLIT
RTECS

Montana's Employee & Community Hazardous Chemical Information Act

to ensure the safety of persons working on them or passing under them or by them and to prevent them from falling or to prevent any material that may be used, placed, or deposited on them from falling.

History: En. Sec. 1, Ch. 107, L. 1909; re-en. Sec. 2672, R.C.M. 1921; re-en. Sec. 2672, R.C.M. 1935; amd. Sec. 8, Ch. 187, L. 1977; R.C.M. 1947, 69-1401.

50-77-102. Temporary floors for protection of workmen. (1) It shall be the duty of every owner, person, or corporation who shall have the direct and immediate supervision or control of the construction or remodeling of any building having more than three framed floors, whether some or all of said floors are above or below the established street grade, to provide and lay upon the upper side of the joists or girders, or both, of the first floor below the riveters and structural steel setters a plank floor, which shall be laid to form a good substantial temporary floor for the protection of employees and all persons engaged above or below or on such temporary floor in such building.

(2) Where the permanent floor is in place on the floor herein required to be planked, a temporary protective floor shall not be required.

(3) If the floor or permanent floor of the second floor, any other floor above the second, or roof is being placed previous to the permanent floor immediately below the floor which is being arched or planked, a good substantial temporary floor shall be laid on the joists and girders of the next lower floor.

(4) For the purpose of this section, the lowest framed floor in the building shall be considered the first floor.

History: En. Sec. 2, Ch. 107, L. 1909; re-en. Sec. 2673, R.C.M. 1921; R.C.M. 1947, 69-1402.

50-77-103. Planking above scaffolds. In buildings more than three stories high where persons are working on a scaffold or scaffolds on the outside of such buildings, such persons shall be protected by well secured planking set over the heads of such persons for the full width of the scaffolding on which they are working if another story or stories are being raised above such persons during the time they are working on such outside scaffold or scaffolding.

History: En. Sec. 3, Ch. 107, L. 1909; re-en. Sec. 2674, R.C.M. 1921; R.C.M. 1947, 69-1403.

50-77-104. Guarding of stairways and other openings. It shall be the duty of all owners, contractors, builders, or persons having the direct and immediate control or supervision of any buildings in course of erection, which shall be more than 30 feet high, to see that all stairways, elevator openings, flues, and all other openings in the floors shall be covered or properly protected.

History: En. Sec. 4, Ch. 107, L. 1909; re-en. Sec. 2675, R.C.M. 1921; re-en. Sec. 2675, R.C.M. 1935; R.C.M. 1947, 69-1404(part).

50-77-105. Temporary toilets. Wherever such building or buildings over three stories high, other than a residence, are being erected in any city or town, temporary toilets in or convenient to such building shall be maintained for the convenience of the employees.

History: En. Sec. 4, Ch. 107, L. 1909; re-en. Sec. 2675, R.C.M. 1921; re-en. Sec. 2675, R.C.M. 1935; R.C.M. 1947, 69-1404(part).

50-77-106. Building inspector to enforce chapter. It is hereby made the duty of the building inspector, his deputy, or other authorities in any county, city, town, or village in the state, through the county attorney or any other attorney, in case of failure of such owner, person, or corporation to comply with this chapter promptly, to take the necessary steps to enforce the provisions of this chapter.

History: En. Sec. 5, Ch. 107, L. 1909; re-en. Sec. 2676, R.C.M. 1921; re-en. Sec. 2676, R.C.M. 1935; R.C.M. 1947, 69-1405(part).

50-77-107. Penalty for violation. Any person violating any of the provisions of the foregoing sections shall be fined not less than $100 or more than $200 for each offense.

History: En. Sec. 5, Ch. 107, L. 1909; re-en. Sec. 2676, R.C.M. 1921; re-en. Sec. 2676, R.C.M. 1935; R.C.M. 1947, 69-1405(part).

CHAPTER 78

EMPLOYEE AND COMMUNITY HAZARDOUS CHEMICAL INFORMATION ACT

Part 1 — General

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Chapter Compiler's Comments

Effective Date: Section 17, Ch. 641, L. 1985, provided that this chapter is effective November 25 1985

Chapter Cross-References

Occupational health, Title 50, ch. 70.
Occupational safety, Title 50, ch. 71.

Part 1
General

50-78-101. Short title. This chapter may be known and cited as the "Employee and Community Hazardous Chemical Information Act".

History: En. Sec. 1, Ch. 641, L. 1985.

50-78-102. Definitions. As used in this chapter, the following definitions apply:

(1) "Chemical manufacturer" means an employer in standard industrial classification codes 20 through 39, as defined in the federal Standard Industrial Classification Manual, with a workplace where chemicals are produced for use or distribution.

(2) "Chemical name" means the scientific designation of a chemical in accordance with the nomenclature system developed by the international union of pure and applied chemistry or the chemical abstracts service rules of nomenclature or a name that will clearly identify the chemical for the purpose of conducting a hazard evaluation.

(3) "Common name" means any designation or identification, such as code name, code number, trade name, brand name, or generic name, used to identify a chemical other than by its chemical name.

(4) "Department" means the department of health and environmental sciences provided for in Title 2, chapter 15, part 21.

(5) "Designated representative" means:

(a) the individual or organization to whom an employee gives written authorization to exercise the employee's rights under this chapter; or

(b) a recognized or certified collective bargaining agent who is automatically a designated representative without regard to written employee authorization.

(6) "Distributor" means a business, other than a chemical manufacturer, that supplies hazardous chemicals to other distributors or to employers.

(7) "Employee" means a person who may be exposed to hazardous chemicals in his workplace under normal operating conditions or possible emergencies.

(8) "Employer" means a person, firm, corporation, partnership, association, governmental agency, or other entity engaged in business or providing services that employs workers.

(9) "Exposure" means ingestion, inhalation, absorption, or other contact in the workplace with a hazardous chemical and includes potential, accidental, or possible exposure.

(10) "Hazardous chemical" means, except as provided in 50-78-103:

(a) any element, chemical compound, or mixture of elements or compounds which is a physical hazard or health hazard as defined by subsection (c) of the OSHA standard and which has been identified as such by the federal occupational safety and health administration or the manufacturer and has been so filed with the federal occupational safety and health administration;

(b) any hazardous chemical as defined by subsection (d)(3) of the OSHA standard; or

(c) any emitter of ionizing radiation.

(11) "Label" means any written, printed, or graphic material displayed on or affixed to containers of hazardous chemicals.

(12) "Local fire chief" means:

(a) the chief of the municipal fire department or his agent, for any workplace located within a city or town; or

(b) the county rural fire chief or the district rural fire chief or his agent, for any workplace not located within a city or town.

(13) "Manufacturing employer" means an employer with a workplace classified in any standard industrial classification code 20 through 39 who manufactures, uses, or stores a hazardous chemical.

(14) "Material safety data sheet" means a document prepared in accordance with the requirements of the OSHA standard and containing chemical hazard and safe handling information.

(15) "Nonmanufacturing employer" means an employer with a workplace in any standard industrial classification code other than 20 through 39.

(16) "OSHA standard" means the hazard communication standard issued by the federal occupational safety and health administration, codified under 29 C.F.R. 1910.1200, as that statute reads on January 1, 1985.

(17) "Trade secret" means a confidential formula, pattern, process, device, or information, including chemical name or other unique chemical identifier, which is used in an employer's business and which gives the employer an opportunity to obtain an advantage over competitors.

(18) "Work area" means a room or defined space in a workplace where hazardous chemicals are produced, used, or stored and where employees are present.

(19) "Workplace" means an establishment at one geographical location containing one or more work areas.

(20) "Workplace chemical list" means the list of hazardous chemicals developed under this chapter or under subsection (e)(1)(i) of the OSHA standard.

History: En. Sec. 2, Ch. 641, L. 1985.

50-78-103. Applicability — exemptions. (1) The provisions of this chapter do not apply to:

(a) any consumer product intended for personal consumption or use by an employee;

(b) any retail food sale establishment or other retail trade establishment, exclusive of processing and repair areas;

(c) a food, drug, or cosmetic as defined in the Montana Food, Drug, and Cosmetic Act, Title 50, chapter 31;

(d) a source of ionizing radiation that is an exempt or generally licensed material or device, as defined and described in rules adopted under 75-3-202 and implementing 75-3-104 and 75-3-202;

(e) the radiological properties of any source, byproduct, or special nuclear material as defined in sections 11(z), 11(aa), and 11(e)(1) of the federal Atomic Energy Act of 1954; or

(f) sealed containers of hazardous chemicals during transportation or while in storage at transportation terminals, so long as existing labels are not

removed or defaced and the employer complies with state and federal regulations relating to the transportation of hazardous chemicals.

(2) Employers operating the following workplaces are in compliance with this chapter if they retain and make accessible to employees and, when applicable, to students, all material safety data sheets received or, if no material safety data sheet is received for a hazardous chemical, any other information received on its hazards and safe handling and if the provisions of 50-78-206, 50-78-301(6) through (8), and 50-78-305 are met:

(a) a teaching, research, or testing laboratory, including any associated storeroom;

(b) a clinical laboratory or health care facility as defined in 50-5-101;

(c) a pharmacy as defined in 37-7-101; or

(d) an office of a physician, dentist, osteopath, podiatrist, optometrist, or veterinarian licensed under Title 37.

(3) The provisions of this chapter do not apply to any hazardous chemical subject to the packaging and labeling requirements imposed under the Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C. 136, et seq., except that a chemical manufacturer producing such hazardous chemicals must comply with all provisions of this chapter.

History: En. Sec. 3, Ch. 641, L. 1985.

Compiler's Comments

Compiler Clarification: A committee of the whole amendment to SB 452 (Ch. 641, L. 1985) inserted subsection (2) of 50-78-301. Because this amendment renumbered subsequent subsections, the compiler has substituted a reference to subsections (6) through (8) of 50-78-301 for a reference to 50-78-301(5) through (7) in subsection (2) of this section to reflect the intent of the bill as introduced.

50-78-104. Relationship to OSHA standard. (1) Manufacturing employers and distributors that are regulated by and complying with the provisions of the OSHA standard are exempt from the provisions of this chapter, except for 50-78-202 through 50-78-204 and 50-78-301.

(2) Nonmanufacturing employers that adopt and comply with the provisions of the OSHA standard are exempt from the provisions of this chapter, except for 50-78-202 through 50-78-204 and 50-78-301.

History: En. Sec. 4, Ch. 641, L. 1985.

Part 2

Notice Required

50-78-201. Notice to employees. Employers shall post adequate notice at locations where notices are normally posted informing employees about their rights under this chapter.

History: En. Sec. 5, Ch. 641, L. 1985.

50-78-202. Workplace chemical list. (1) Each employer shall compile and maintain a workplace chemical list that must contain the following information for each hazardous chemical present in the workplace:

(a) except as provided in 50-78-205, all generally used common names of any hazardous chemical present in the workplace, cross-referenced to the chemical name; and

(b) the work area in which the hazardous chemical is normally stored or used.

(2) The workplace chemical list may be prepared for the workplace as a whole or for each work area, provided the list is readily available to employees and their designated representatives.

(3) New or newly assigned employees must be made aware of the workplace chemical list before working with or in a work area containing hazardous chemicals.

(4) The workplace chemical list must be updated as necessary but not less than annually.

History: En. Sec. 6, Ch. 641, L. 1985.

50-78-203. Material safety data sheets. (1) Each chemical manufacturer or distributor shall provide a manufacturing or nonmanufacturing employer with the appropriate material safety data sheet upon delivery of a hazardous chemical.

(2) Each employer shall maintain the most current material safety data sheet for each hazardous chemical in the workplace. If a material safety data sheet has not been provided by the chemical manufacturer or distributor at the time a hazardous chemical is delivered to the employer, the employer shall request one in writing within 5 working days. Each employer shall maintain a copy of any correspondence sent or received by the employer in an effort to obtain a material safety data sheet for a hazardous chemical when none was provided by the chemical manufacturer or distributor.

(3) Material safety data sheets must be provided by the employer to any employee or designated representative upon request for review or copying.

History: En. Sec. 7, Ch. 641, L. 1985.

50-78-204. Employee rights. (1) An employee who may be exposed to hazardous chemicals must be informed of the potential or actual exposure and must be provided access to the workplace chemical list and to the material safety data sheet for each hazardous chemical. An employer who does not provide an employee with information on a hazardous chemical within 5 working days of the request for information, as required by this chapter, may not require the employee to work with the hazardous chemical until the information is made available.

(2) Each employee must receive training from his employer, as provided in 50-78-305 or in the OSHA standard, on the hazards of workplace chemicals and on protective measures for handling those chemicals.

(3) Each employee required to work with a hazardous chemical must be provided with appropriate personal protective equipment.

(4) No employer shall discharge, cause to be discharged, discipline, discriminate against, or initiate any adverse personnel action against any employee who exercises his rights, testifies, or assists others in exercising their rights or duties under this chapter.

(5) A waiver by an employee of the benefits, rights, or requirements of this chapter is against public policy and is void. An employer's request or requirement that an employee waive any rights under this chapter as a condition of employment is a violation of this chapter.

(6) A designated representative may act on behalf of an employee in pursuing any right or enforcement remedy under this chapter.

History: En. Sec. 10, Ch. 641, L. 1985.

Cross-References
What is unlawful, 28-2-701.
The employment relationship, Title 39, ch. 2.

50-78-205. Trade secret confidentiality. (1) An employer who believes that the name of a hazardous chemical is a trade secret may withhold the chemical name from the material safety data sheet and workplace chemical list only if:

(a) a material safety data sheet, coded to an identifying notation on each container of the hazardous chemical, is available in the work area where the hazardous chemical is present;

(b) the material safety data sheet discloses the properties and effects of the hazardous chemical;

(c) the specific chemical identity is provided to a treating physician or nurse in the event of a medical emergency, as provided for in subsection (i)(2) of the OSHA standard;

(d) the specific chemical identity is provided in nonemergency situations to a health professional providing medical or other occupational health services to an exposed employee, as provided for in subsections (i)(3) through (5) of the OSHA standard; and

(e) the employer claims that the information is a trade secret and that claim can be supported.

(2) If a person believes that disclosing certain trade information on a material safety data sheet will reveal a trade secret, a trade secret claim may be filed with the department, which shall use this procedure to determine the validity of the trade secret claim:

(a) The department shall give notice by certified mail to the person making the claim to submit trade secret substantiation information within 30 days after receipt of such notice. Failure to supply the substantiation information constitutes a waiver of the trade secret claim.

(b) The department has the responsibility to determine the validity of the trade secret claim and shall consider the trade secret substantiation information as confidential.

(c) If the department determines the trade secret claim is not valid, the department shall so notify by certified mail the person making the claim for trade secret protection, stating the basis for the decision. The person making the claim has 30 days after notification by the department to initiate judicial review in the district court of Lewis and Clark County and obtain a preliminary injunction or other court order to prevent disclosure of the trade secret.

(d) The unauthorized use or disclosure of trade secret information submitted under this section is a misdemeanor.

History: En. Sec. 11, Ch. 641, L. 1985.

Cross-References
Uniform Trade Secrets Act, Title 30, ch. 14, part 4.
Misdemeanor — no penalty specified, 46-18-212.

50-78-206. Labels. (1) An employer or distributor may not remove or deface any existing label on a container of a hazardous chemical, except that

the chemical name may be concealed under trade secret protection as provided in 50-78-205.

(2) Any portable container intended for an immediate transfer of a hazardous chemical is not required to be labeled.

History: En. Sec. 8, Ch. 641, L. 1985.

Part 3
Information and Education

50-78-301. Emergency and community information. (1) Except as provided in subsection (2), an employer normally having hazardous chemicals in the workplace of his employees shall submit the following information to the clerk and recorder of the county in which the workplace is located:

(a) a copy of the most current material safety data sheet certified by the employer for each hazardous chemical in the workplace;

(b) an acknowledged copy of each new annual workplace chemical list; and

(c) a list acknowledged by the employer of the names or titles and telephone numbers of knowledgeable representatives of the employer or the chemical manufacturer who can be contacted for further information or in case of an emergency.

(2) The county clerk and recorder shall record and update as necessary an index listing each hazardous chemical for which a material safety data sheet has been recorded in the county. The index must include the name of the employer who recorded the material safety data sheet. No employer shall be required to record a material safety data sheet for any hazardous chemical for which a material safety data sheet has already been recorded by any employer in the county.

(3) The county clerk and recorder shall record the information provided under subsection (1). The county clerk and recorder shall index the information provided under subsection (1) by workplace name, and all entries for a workplace must be grouped together in the index. The index must not be combined with any other type of index.

(4) All information submitted under subsection (1) is public information and must be available at the office of the county clerk and recorder during normal working hours to any person for inspection and copying at the expense of the person requesting copies.

(5) The local fire chief shall inspect all information maintained by the county clerk and recorder on workplace hazardous chemicals.

(6) The local fire chief must be permitted onsite inspection of hazardous chemicals in any workplace, including workplaces under the control of a state agency, for the purposes of planning fire department activities in case of an emergency and reviewing compliance with this chapter. For a workplace that employs fire safety personnel, the local fire chief shall consult with the responsible fire safety official to clarify respective roles and response procedures in the event of an emergency.

(7) As a result of an inspection, the local fire chief may note and report for possible action by the county attorney or other appropriate law enforcement official any violation by an employer of a provision of this chapter or any other law pertaining to hazardous chemicals or fire safety.

(8) The local fire chief shall consult at least annually on safety and emergency considerations with each person responsible for the operation of any research, educational, or testing laboratory workplace. The consultation may result in recommendations or, under the provisions of 50-62-108, orders by the fire chief to be implemented by the laboratory operator to enhance public safety, to reduce the likelihood of emergency incidents, or to improve emergency response in the event of an accident. The person responsible for the operation of the laboratory shall contact the local fire chief at any time there is a significant change in the location or nature of the hazardous chemicals in the workplace, initiation of any new and potentially dangerous method of processing or reacting hazardous chemicals, or any other operational change affecting emergency response considerations.

History: En. Sec. 9, Ch. 641, L. 1985.

Cross-References

Role and duties of County Clerk, 7-4-2611.

Duties of chief and assistant chief of fire department, 7-33-4104.

50-78-302 through 50-78-304 reserved.

50-78-305. Employee education program. (1) Each employer shall provide, at least annually, an education and training program for all his employees using or handling hazardous chemicals. Additional instruction must be provided whenever the potential for exposure to hazardous chemicals is altered or whenever new and significant information is received by the employer concerning the hazards of a chemical. New or newly assigned employees must be provided training before working with or in a work area containing a hazardous chemical.

(2) The programs must provide instruction in:

(a) interpreting labels and material safety data sheets and the relationship between these two methods of hazard communication;

(b) the location and acute and chronic effects of hazardous chemicals used by the employees; and

(c) the safe handling, protective equipment, first-aid treatment, and cleanup and disposal procedures for hazardous chemicals.

(3) The employer shall keep a record of the dates of training sessions given to employees and the names of the employees attending.

History: En. Sec. 12, Ch. 641, L. 1985.

50-78-306. Departmental information program. (1) The department may develop and provide to any employer a suitable form of notice to inform employees of their rights under this chapter.

(2) The department may develop an education and training program to assist employers in complying with the provisions of 50-78-204.

(3) The department may develop and distribute a supply of informational leaflets on employer duties, employee rights, the effects of hazardous chemicals, and any other topic related to hazardous chemicals in the workplace.

(4) The department may contract with the Montana university system or any other public or private organization to develop and implement an information program on hazardous chemicals in the workplace.

History: En. Sec. 13, Ch. 641, L. 1985.

Part 4

Enforcement and Penalties

50-78-401. No effect on other duties or liabilities. The provision of information to an employee does not in any way affect the liability of an employer with regard to the health and safety of an employee or other person exposed to hazardous chemicals, nor does it affect the employer's responsibility to take any action to prevent the occurrence of occupational disease or accident as required under any other provision of law. The provision of information to an employee does not affect any other duty of a manufacturer, producer, or formulator to warn ultimate users of a hazardous chemical under any other provision of law.

History: En. Sec. 14, Ch. 641, L. 1985.

50-78-402. Complaints, investigation, and penalties. (1) An employee in a workplace covered by the OSHA standard who believes his employer is not complying with the provisions of the OSHA standard may report the alleged violation to the federal occupational safety and health administration.

(2) An employee who believes an employer is not complying with the provisions of this chapter may submit a written complaint to the local health officer, as defined and described in Title 50, chapter 2, part 1.

(3) If the local health officer chooses to act on the complaint, he shall:

(a) within 5 working days of receipt of the complaint, investigate the complaint and, in the event of an apparent violation, seek a corrective response from the employer;

(b) within 10 working days of receipt of a complaint, complete a report that details the findings of the investigation and the response of the employer;

(c) upon completion of the report, submit copies to the employee requesting the investigation, the county attorney, and the employer; and

(d) if the evidence suggests that the employer has violated the provisions of this chapter and the health officer does not receive a corrective response within 10 days of notifying the employer of the violation, file a complaint in the appropriate court or request appropriate action by the county attorney to prosecute the alleged violation.

(4) An employee may submit a written complaint to the county attorney.

(5) The county attorney shall investigate any complaint received and, if a violation appears to have occurred and the county attorney does not receive a corrective response within 10 days of notifying the employer of the violation, initiate appropriate court proceedings to prosecute the violation.

(6) A person found to be knowingly in violation of this chapter is guilty of a misdemeanor. Each day of violation is a separate offense.

History: En. Sec. 15, Ch. 641, L. 1985.

Cross-References

Misdemeanor — penalty specified, 46-18-212.

The Bozeman Daily Chronicle's

Written Hazard Communication Program

TABLE OF CONTENTS

PROGRAM RECORDS

Written Program

The Bozeman Daily Chronicle Hazard Communication Program has been established in order to comply with the requirements of the Hazard Communication Act as well as Montana's Employee and Community Hazardous Chemical Information Act, both laws effective as of November 25, 1985. This hazard communication program outlines the requirements of the above laws in such a way that employers and employees receive the information they need to help insure safe work practices.

Copies of the program are placed in binders located in the workplace for reference by employees. The program is also available in the Production Manager's office for review by all employees. The Production manager will update the written program when necessary and check the binders periodically to see that the written program has not been removed.

Material Safety Data Sheets

Material Safety Data Sheets (MSDS) are obtained from all manufacturers and distributors for all chemical products used at The Bozeman Daily Chronicle. Suppliers are notified that complete MSDS are to be submitted to The Bozeman Daily Chronicle and that trade secret claims must be clearly stated. Suppliers are notified that new MSDS are required in the event of a change

in product formulation or when additional information becomes available.

The Production Manager is responsible for requesting, obtaining and maintaining the Material Safety Data Sheets. He/She will update the MSDS when new product information becomes available. The following check list is used for obtaining MSDS:

1. Use a standard letter to request MSDS for each product listed on the chemical product list. A copy of the standard letter is located in Appendix B, page 189.
2. Insist on complete and current MSDS. Review all MSDS for completeness. Each section must contain all appropriate responses, even if the appropriate responses are noted as not applicable.
3. Require that trade secret claims be clearly designated.
4. Require MSDS with trade secret claims have 24-hour emergency telephone numbers included.
5. If a product is non-hazardous and lacks an MSDS, request that the supplier provide a letter stating that it is non-hazardous and not covered by the OSHA Hazard Communication Standard.
6. Maintain a file of correspondence with manufacturers and distributors regarding MSDS.

All MSDS are photocopied and placed in binders along with copies of the chemical list, this written program and the work practice procedures. The MSDS are divided according to the work

area in which the specific chemical products are found. Figure 1 on page 44 presents an overview of the 4 operational areas within The Bozeman Daily Chronicle. Employee MSDS request forms are also available from the Production Manager in the case that an employee encounters a chemical product for which there is not a MSDS available in the information binder. The MSDS request forms outline chemical information necessary to the Production Manager in order for him/her to contact the manufacturer or distributor concerning the chemical in question.

Chemical Product List

A complete list of chemical products is prepared from the Material Safety Data Sheets. An inventory is taken of all chemical products and checked with the list. The list is organized by department and product type and the name, address and telephone number of the manufacturer of the chemical product appears across from the chemical listing. The chemical product list is divided into operational areas and therefore the chemical list for the photography area only appears in the binder located in or near the photography area. Other operational areas include circulation, press and composition.

The Production Manager is responsible for compiling the initial list as well as updating the chemical product list whenever new products are introduced to the workplace.

Work Practices of Routine and Non-routine Tasks

A set of proper work practices for hazardous chemical use in routine as well as non-routine tasks must be established and located in the information binders according to operational area. These work practices are developed to minimize employee chemical exposures.

The development of the set of proper work practices is based on the ideas listed below.

1. MSDS are thoroughly reviewed to identify all special handling precaution.
2. Chemical product manufacturers and distributors are contacted to determine if they have any printed work practices or instructions for the proper use of their product.
3. Operations involving direct hand contact with chemicals require use of appropriate gloves to minimize contact.
4. Employees are required to thoroughly wash their hands following the use of chemicals and prior to eating, using restrooms or leaving work.
5. Operations involving pouring of chemicals require the use of appropriate eye protection.
6. Operations requiring the use of volatile chemicals and cleaning are only to be performed in open areas or with appropriate ventilation.

7. Employee smoking is prohibited during operations which require use of liquid chemicals that have a flash point of 200 degrees Ferenheit or less.
8. Operations in confined spaces are carefully reviewed.

Emergency Procedures

Emergency procedures are established for handling fire emergencies as well as for foreseeable chemical disasters such as ink and solvent spills. The chemical disaster procedures outline methods for containment and rapid cleanup. Attention is also given to exposure hazards for anyone attempting to clean up the spill. An outline of the emergency procedures is available in all employee information binders.

Employee Request Forms

Employee have the right to request information about the toxic substances with which they work. Employee information and MSDS request forms are available from the Production Manager.

Right To Know Training Log

The Production Manager keeps on file a training log to be used to record which employees have received training in hazard communication. The employee validates the record with his/her signature upon completing the training session(s). The date of training and the training officer is also be indicated in the training log.

Community Right-To Know Information

The Montana Right-To-Know law requires that The Bozeman Daily Chronicle submit the following information to the clerk and recorder of Gallatin county:

a) a copy of the most current material safety data sheet certified by the employer for each hazardous chemical in the workplace:

b) an acknowledged copy of each new annual workplace chemical list and:

c) a list acknowledged by the employer of the names or titles and telephone numbers of knowledgeable representatives of the employer or the chemical manufacturer who can be contacted for further information or in case of an emergency.

EMPLOYEE TRAINING & EDUCATIONAL MATERIALS

The Production Manager is responsible for coordinating employee hazard training sessions. An initial training session is given to inform all present employees of their rights under Federal and state law as well as inform them of the chemical hazards.

Before starting work each new employee must attend a safety class and be given information on:

a) chemicals and their hazards in their work areas:

b) how to lessen or prevent exposure to these hazardous chemicals;

c) what the company has done to lessen or prevent workers' exposure to these chemicals and;

d) procedures to follow if they are exposed to these chemicals.

After attending the class each employee signs the training log stating that they received the information outlined above and received safety training.

Preliminary Training

The preliminary portion of the training program outlines the Hazard Communication Standard and the Employee and Community Chemical Information Act. The purpose and content of these two laws, as well as the difference between the laws, is presented in this section of the training program. Employee rights including information access, and chemical information and MSDS requests are discussed. The procedure for filing work complaints concerning chemical exposure is also discussed.

During preliminary training, methods used by The Bozeman Daily Chronicle to implement the Federal and state standards are introduced. These methods include the written program, the chemical product list, MSDS, MSDS interpretation guide, labeling and hazardous chemical information forms, work practice guidelines and employee training.

Introduction to the Chemical List

Following the preliminary training, employees are introduced to the chemical product lists which are divided according to operational area. Access to and layout of the list is discussed .

Material Safety Data Sheet Interpretation Guide

Employees are familiarized with the Material Safety Data Sheets that represent the chemical product list. A MSDS Interpretation Guide is placed in the information binders which provides support for the Bozeman Daily Chronicle's training efforts and serves as a reference source for explaining MSDS. The guide includes a glossary of common MSDS terms intended to answer many commonly asked questions about information found on MSDS. Photocopies of the guide are placed in the Production Manager's central files. The MSDS interpretation guide was taken from ANAP's HazCom Program.(1)

Primary Training

Detailed training is provided for all covered employees on the chemical products that are present in the photography, composition, press and circulation areas of The Bozeman Daily Chronicle. The following areas are discussed in detail:

1. Container labeling - The information required on the label and how to interpret the label.
2. Hazardous Materials Identification System (HMIS) - How this particular marking system is used and where it is used.
3. Operational area placarding - How to interpret the placard.

4. Operations where hazardous chemicals are used.
5. Chemical hazards.
6. Exposure minimization.
7. Personal protective measures.
8. Chemical detection methods.
9. Proper work practices for routine and non-routine tasks that involve the use of hazardous chemicals.
10. Emergency procedures

CONTAINER LABELING & AREA PLACARDING

Container Labeling

The Production Manager is responsible for checking all chemical containers for appropriate labels upon delivery. The container labels must indicate the following information:

a) Product name as it appears on the MSDS;

b) The hazardous chemical ingredients;

c) The appropriate hazard warning and;

d) The name and address of the manufacturer, distributor, or other responsible party.

The Production manager must replace removed or damaged labels with a new label bearing the same information as listed above. He/she also must ensure the labeling on bulk tanks.

Alternate containers used for chemical products that are transferred for use or storage from a drum or bulk tank are also labeled. Temporary, short-term containers intended for immediate use do not require labels if they will only be used by the employee who fills the container.

Area Placarding

Main sections of each of the 4 operational areas are placarded to adequately inform workers of the chemical product and the associated degree of hazard. The placards use the

Hazardous Material Identification System (HMIS) labeling system that is described and presented in the employee information binders. The placards indicate the chemical product(s) and/or product type(s) as well as a health, flammability and reactivity rating. One placard represents each of the HMIS rating schemes that appear with the chemical product list for a particular operational area. The names of the chemical products having a particular rating scheme are identified on the placard. The HMIS marking system is used as a method of representing general chemical health and physical hazards where as individual container markings are used to target specific health hazards such as organ damage.

CONTRACTOR NOTIFICATION

The Production Manager is responsible for contacting any contractors prior to the start of work at the newspaper to inform them of the nature of the chemical products around which they will be working. The contractors are provided access to/or copies of the employee information binders containing The Bozeman Daily Chronicle's written hazard communication program as well as the chemical product lists, MSDS, MSDS interpretation guide, work practices for routine and non-routine tasks and emergency procedures. The contractors are required to sign an acknowledgement log confirming their review of the information binder. The acknowledgement log is kept in the Production Manager's central file. The binders are available before the contractors begin work. The contractors are requested to review the information with their employees prior to the start of work at The Bozeman Daily Chronicle.

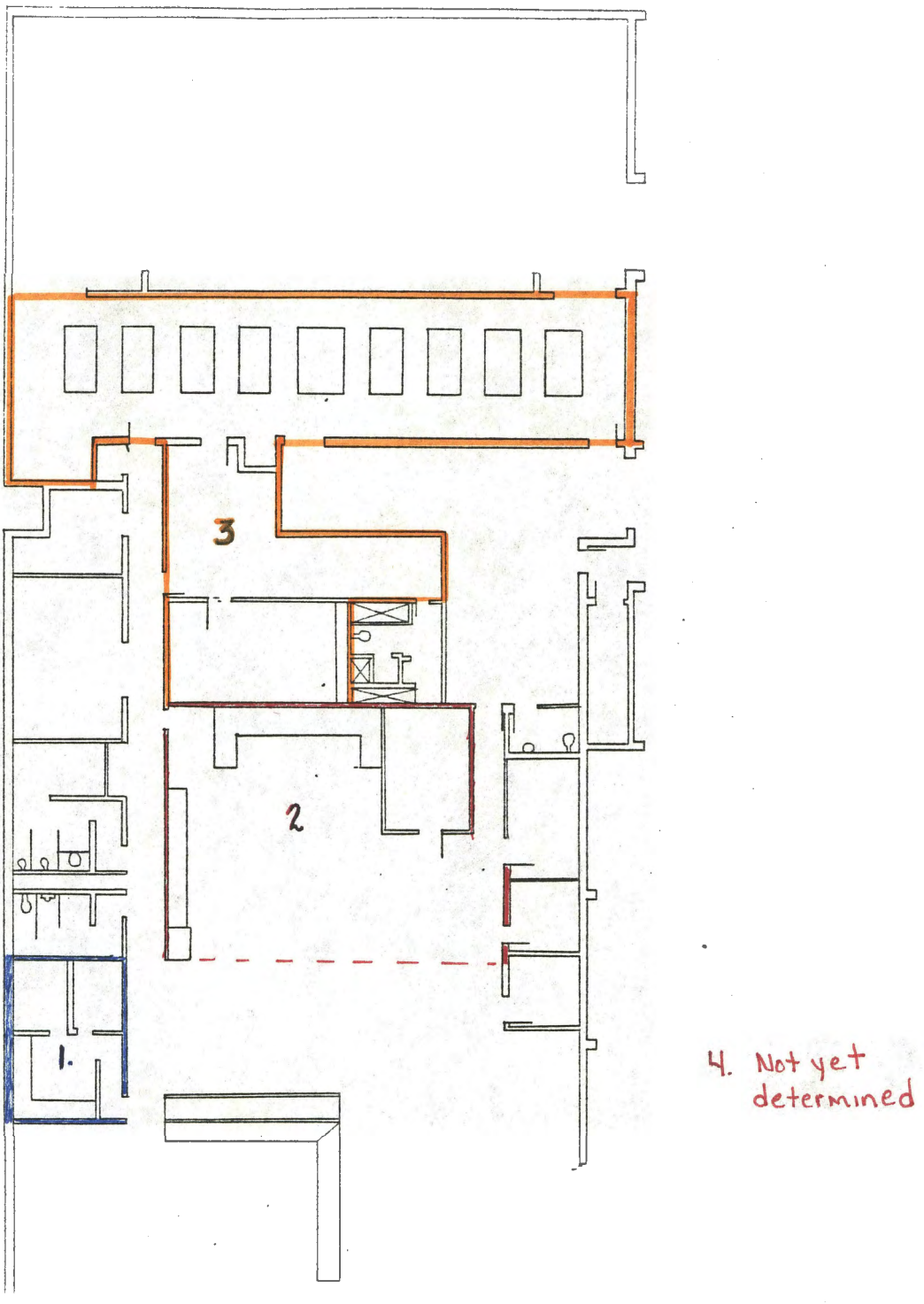

Figure 1. Bozeman Daily Chronicle's Operational Areas (Area 1-Photography, Area 2-Composition, Area 3-Press, Area 4-Circulation)

Chemical Product List

by operational area

CHEMICAL PRODUCT LIST

DEPARTMENT: Photography Area

Product Type	Chemical Product	Manufacturer/Address
Fixer	Rapid Fixer, Part A	Eastman Kodak Co. 343 State St. Rochester, NY 14650 (716)458-1000 ext.85566
Fixer	Rapid Fixer, Part B	Eastman Kodak Co. 343 State St. Rochester, NY 14650 (716)458-1000 ext. 85566
Activator	SII Activator	Eastman Kodak Co. 343 State St. Rochester, NY 14650 (716)458-1000 ext. 85566
Deactivator	SII Deactivator	Eastman Kodak Co. 343 State St. Rochester, NY 14650 (716)458-1000 ext. 85566
Developer	Dektol	Eastman Kodak Co. 343 State St. Rochester, Ny 14650 (716)458-1000 ext. 85566
Developer	Acufine	Acufine 439 E. Illinois St Chicago, Il 60611 (312)321-0240
Developer	D-76	Eastman Kodak 343 State St. Rochester, NY 14650 (716)458-1000 ext. 85566
PMT	DD-2.5 Diffusion Transfer Developer	Alta Chemical Co. 11526-F Sorrento Valley Rd. San Diego, CA 92121 (619)453-5010

Wash	Orbit Bath	TKO Chemical Co 401 Angelique St. St. Joseph, MI 64501 (816)232-7194
Wash	Photo-Flo 200	Eastman Kodak Co. 343 State St. Rochester, NY 14650 (716)458-1000 ext. 85566
Film Cleaner	Film Cleaner	Eastman Kodak Co. 343 State St. Rochester, NY 14650 (716)458-1000 ext. 85566
Process Cleaner	Stabilization Processor Cleaner	Hurst Graphics 2500 San Fernando Rd. Los Angeles, CA 90065 (213)223-4121

CHEMICAL PRODUCT LIST

DEPARTMENT: Composition Area

Product Type	Chemical Product	Manufacturer/Address
Developer	RCD-5	Alta Chemical Co. 11526-F Sorrento Valley Rd. San Diego, CA 92121 (619)453-5010
Fixer	RF-20 Rapid Fix	Alta Chemical Co. 11526-F Sorrento Valley Rd. San Diego, CA 92121 (619)453-5010
Hardener	RFH Liquid Hardener	Alta Chemical Co. 11526-F Sorrento Valley Rd. San Diego, CA 92121 (619)453-5010
Glass Cleaner	Sprayway Formula 40	Sprayway, Inc. 484 Vista Ave. Addison, Il 60101 (312)628-0998

CHEMICAL PRODUCT LIST

DEPARTMENT: Press Area

Product Type	Chemical Product	Manufacturer/Address
Fixer	RF-20 Rapid Fix	Alta Chemical Co. 11526-F Sorrento Valley Rd. San Diego, CA 92121 (619)453-5010
Hardener	RFH Liquid Hardener	Alta Chemical Co. 11526-F Sorrento Valley Rd. San Diego, CA 92121 (619)453-5010
Developer	GPP LD-41 Part A	GPP P.O. Box 125 Black Horse Lane Monmouth Junction, NJ 08852 (201)297-0100
Developer	GPP LD-41 Part B	GPP P.O. Box 125 Black Horse Lane Monmouth Junction, NJ 08852 (201)297-0100
Replenisher	R-30 Replenisher Part A	Alta Chemical Co. 11526-F Sorrento Valley Dr. San Diego, CA 92121 (619)453-5010
Replenisher	R-30 Replenisher Part B	Alta Chemical Co. 11526-F Sorrento Valley Rd. San Diego, CA 92121 (619)453-5010
Process Cleaner	Process Cleaner	Eastman Kodak Co. 343 State St. Rochester, NY 14650 (716)458-1000 ext.85566
Gum Arabic	100% Gum Arabic	Varn Products Co. Inc. 175 Route 208 Oakland, NJ 07436 (201)337-3600

Sensitizer	NGS Plate Sensitizer	Anchor/Lithkemco 50 Industrial Loop North P.O. Box 979 Orange Park, FL 32073 (904)264-3500
Developer	Black Bristle #7 Plate Developer	Anchor/Lithkemco 50 Industrial Loop North P.O. Box 979 Orange Park, Fl 32073 (904)264-3500
Solvent	Newspaper Blanket & Roller Wash	Hurst Graphics 2500 San Fernando Rd. Los Angeles, CA 90065 (213)223-4121
Fount Solution	Neutrofount	N.D.I. 4985 N. Elston Ave. Chicago, Il 60630 (312)685-0040
Ink	Lo Rub Black	U.S. Printing Ink 943 Murray Hill Parkway East Rutherford, NJ 07073 (201)933-7100
Ink	Colored Ink E.O. Red Impact Cherry Red Impact II Peacock Blue Impact Canary Yellow Mixing White	U.S Printing Ink 943 Murray Hill Parkway East Rutherford, NJ 07073 (201)933-7100

CHEMICAL PRODUCT LIST

DEPARTMENT: Circulation Area

Product Type	Chemical Product	Manufacturer/Address
Duplicator Fluid	Sure-Rite Duplicator Fluid	American Stencil MFG. Co. 1603 W. Algonouin Rd. Mt. Prospect, IL 60056 (312) 437-9800

Material Safety Data Sheets

by operational area

Photography Area

CAT 186 6342 197 3247 146 4106
128 2839 146 4114

MATERIAL SAFETY DATA SHEET

EASTMAN KODAK COMPANY
343 State Street
Rochester, New York 14650

For Emergency Health, Safety, and Environmental Information, call (716) 722-5151
For all other purposes, call the Marketing and Distribution Center in your area.

Date of Preparation: 7/30/83 Approved by U.S. Department of Labor

SECTION I. IDENTIFICATION

- Product Name: KODAK Rapid Fixer, Part A
- Formula: Aqueous Mixture
- Kodak Photographic Chemicals Catalog Number(s): CAT 186 6342 - 52 Gallons; CAT 128 2839 - 30 Gallons; CAT 197 3247 - 5 Gallons; CAT 146 4114 - To Make 5 Gallons; CAT 146 4106 - To Make 1 Gallon
- Solution Number: 4896
- Kodak Accession Number: 427810

SECTION II. PRODUCT AND COMPONENT HAZARD DATA

A.

PRINCIPAL COMPONENT(S):	Percent	TLV®	Kodak Accession No.	CAS Reg. No.
Water	40-50	---	035290	7732-18-5
Ammonium thiosulfate	40-50	---	909586	7783-18-8
Sodium acetate	5-10	---	900227	127-09-3
Boric acid	< 5	---	901064	10043-35-3

B. PRECAUTIONARY LABEL STATEMENT(S):

Commercial Label

No health hazard warning language is needed on the containers.

Household Label

Contains boric acid
CAUTION! HARMFUL IF TAKEN INTERNALLY.
If swallowed, induce vomiting.
Call a physician at once.
KEEP OUT OF THE REACH OF CHILDREN

SECTION III. PHYSICAL DATA

- Appearance and Odor: Clear light yellow solution; slight sulfur dioxide and acetic acid odor
- Boiling Point: > 100 °C (> 212 °F) @ 760 mmHg
- Vapor Pressure: ∿ 18 mmHg @ 20 °C
- Evaporation Rate (n-butyl acetate = 1): Not Available
- Vapor Density (Air = 1): ∿ 0.6
- Volatile Fraction by Weight: ∿ 50 %
- Specific Gravity (H_2O = 1): 1.305
- pH: 4.37
- Solubility in Water: Complete

SECTION IV. FIRE AND EXPLOSION HAZARD DATA

- Flash Point: None
- Extinguishing Media: Not Applicable
- Special Fire Fighting Procedures:
  Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
- Unusual Fire and Explosion Hazards:
  Fire or excessive heat may cause production of hazardous decomposition products.

SECTION V. REACTIVITY DATA

- Stability: Stable
- Incompatibility: Strong alkali
- Hazardous Decomposition Products: Ammonia
- Hazardous Polymerization: Will not occur.

SECTION VI. TOXICITY AND HEALTH HAZARD DATA

A. EXPOSURE LIMITS: Not Applicable

B. EXPOSURE EFFECTS: Low hazard

Ingestion: Harmful if taken internally.

C. FIRST AID: In case of eye contact, flush with plenty of water.

Ingestion: If swallowed, if conscious, rinse mouth and induce vomiting immediately by giving 1 or 2 glasses of water and touching back of throat with finger or blunt object. Never give anything by mouth to an unconscious person.

CALL A PHYSICIAN AT ONCE.

SECTION VII. PERSONAL PROTECTION AND CONTROLS

A. RESPIRATORY PROTECTION: None should be needed.

B. VENTILATION:

Local Exhaust: None should be needed.

Mechanical (General): Recommended.

C. SKIN AND EYE PROTECTION:

None should be needed, but good industrial hygiene practice should be followed.

SECTION VIII. SPECIAL STORAGE AND HANDLING PRECAUTIONS

Avoid contact with strong alkali.

SECTION IX. SPILL, LEAK, AND DISPOSAL PROCEDURES

Flush material to sewer with large amounts of water. Discharge, treatment, or disposal may be subject to federal, state, or local laws.

SECTION X. ENVIRONMENTAL EFFECTS DATA

A. SUMMARY:

This chemical formulation has not been tested for environmental effects. Some laboratory test data and published data are available for the major components of this chemical formulation, and these data have been used to provide the following estimate of environmental impact:[1,2,3,4]

This chemical formulation has a high biological oxygen demand, and it is expected to cause significant oxygen depletion in aquatic systems. It is expected to have a low potential to affect aquatic organisms. It is expected to have a moderate potential to affect secondary waste treatment microorganisms. It is expected to have a moderate to high potential to affect the germination and growth of some plants. The components of this chemical formulation are biodegradable and are not likely to bioconcentrate. If diluted with a large amount of water, this chemical formulation released directly or indirectly into the environment is not expected to have a significant impact.

SECTION XI. TRANSPORTATION

Transportation information may be obtained by requesting an EXTERNAL TRANSPORTATION ADDENDUM sheet by catalog number(s) from Kodak Publications Data Services, Eastman Kodak Company, 343 State Street, Rochester, New York 14650.

SECTION XII. REFERENCES

1. Toxicity results are from unpublished data, Health, Safety, and Human Factors Laboratory, Eastman Kodak Company, Rochester, New York.

2. Verschueren, K., Handbook of Environmental Data on Organic Chemicals, Van Nostrand Reinhold Company, New York, N.Y., 1977.

3. Battelle's Columbus Laboratories, Water Quality Critical Data Book - Vol. 3 - Effects of Chemicals on Aquatic Life - Selected Data from the Literature Through 1968, for the U.S. Environmental Protection Agency, Project No. 18050 GWV, Contract No. 68-01-007, May 1971.

4. National Association of Photographic Manufacturers, Inc. and Hydroscience, Inc., Environmental Effects of Photoprocessing Chemicals, National Association of Photographic Manufacturers, Harrison, New York, 1974, 2 vols.

The information contained herein is furnished without warranty of any kind. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of the suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers.

@146-4106*
@146-4114*
@197-3247*
@128-2839*
@186-6342*
82-1264

197 8221
116 4106

MATERIAL SAFETY DATA SHEET

EASTMAN KODAK COMPANY
343 State Street
Rochester, New York 14650

For Emergency Health, Safety, and Environmental Information, call: (716) 722-5151.
For all other purposes, call the Marketing and Distribution Center serving your area.

Date of Preparation: 9/13/82 Approved by U.S. Department of Labor

SECTION I. IDENTIFICATION

- Product Name: KODAK Rapid Fixer, Part B
- Formula: Aqueous Mixture
- Formula Date: 7/16/82
- Kodak Photographic Chemicals Catalog Number(s): CAT 173 3013 - 72 ounces; CAT 197 3221 - 5 Gallons; CAT 146 4106 - To Make 1 Gallon; CAT 146 4114 - To Make 5 Gallons
- Solution Number: 4415
- Kodak Accession Number: 365686
- *Kodak Hazard Rating Codes: R: 1 S: 3 F: 0 C: 0

*The Kodak Health Hazard Rating Code for Respiratory (R) exposure and Skin and Eye (S) exposure is on a scale of Low = 1; Moderate = 2; and High = 3. The Kodak Fire (F) and Reactivity (C) Hazard Codes are on an ascending scale from 0 to 4. F denotes relative flammability and C denotes relative reactivity or instability. Subcategories of C: (W) - water reactive, (A) - pyrophoric, (X) - oxidizer.

DO NOT CONFUSE WITH NFPA CODES!

SECTION II. PRODUCT AND COMPONENT HAZARD DATA

A. COMPONENT(S):	Percent	TLV*	Kodak Accession No.	CAS Reg. No.
Water	65-75	---	035290	7732-18-5
Aluminum sulfate	10-20	2 mg/m^3	907954	10043-01-3
*Sulfuric acid	10-15	1 mg/m^3	907485	7664-93-9

[*Principal Hazardous Component(s)]

B. PRECAUTIONARY LABEL STATEMENT(S):

Household Label

Contains sulfuric acid
X POISON X
DANGER! MAY CAUSE BURNS OF SKIN AND EYES.
HARMFUL IF SWALLOWED.
DO NOT GET IN EYES, ON SKIN, ON CLOTHING.
In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes.
If swallowed do NOT induce vomiting.
Give milk or water.
Call a physician at once.
KEEP OUT OF REACH OF CHILDREN

Commercial Label:

Contains sulfuric acid
WARNING! May cause burns of skin and eyes.
In case of contact, flush skin or eyes with plenty of water; for eyes, get medical attention.

SECTION III. PHYSICAL DATA

- Appearance and Odor: Clear, water-white solution; slight sulfur dioxide odor
- Boiling Point: > 100 °C (> 212 °F) @ 760 mmHg
- Vapor Pressure: ∿ 17 mmHg @ 20 °C
- Evaporation Rate (n-butyl acetate = 1): Not Available
- Vapor Density (Air = 1): ∿ 0.6
- Volatile Fraction by Weight: ∿ 71 %
- Specific Gravity (H_2O = 1): 1.30
- pH: ∿ 1.0
- Solubility in Water (by Weight): Complete

SECTION IV. FIRE AND EXPLOSION HAZARD DATA

- Flash Point: None
- Flammable Limits in Air (% by volume in air): None
- Extinguishing Media: Not Applicable
- Special Fire Fighting Procedures: None
- Unusual Fire and Explosion Hazards: None

SECTION V. REACTIVITY DATA

- Stability: Stable
- Incompatibility: Alkali
- Hazardous Decomposition Products: None
- Hazardous Polymerization: Will not occur.

SECTION VI. TOXICITY AND HEALTH HAZARD DATA

A. THRESHOLD LIMIT VALUE: See Section II

B. EXPOSURE EFFECTS:

Eyes: May cause eye burns.

Skin: Prolonged or repeated skin contact may result in burns.

Ingestion: Harmful if swallowed.

C. FIRST AID:

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes and get medical attention.

Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention.
Launder contaminated clothing before reuse.

Ingestion: Do not induce vomiting. Give milk or water.
CALL A PHYSICIAN AT ONCE.

SECTION VII. PERSONAL PROTECTION AND CONTROLS

A. RESPIRATORY PROTECTION: None should be needed.

B. VENTILATION:

Local Exhaust: None should be needed.

Mechanical (General): Recommended

C. SKIN AND EYE PROTECTION:

Protective gloves should be worn.
Safety glasses with side shields or goggles are recommended.

SECTION VIII. SPECIAL STORAGE AND HANDLING PRECAUTIONS

None

SECTION IX. SPILL, LEAK, AND DISPOSAL PROCEDURES

Wear suitable protective equipment.
Neutralize with sodium carbonate.
Flush material to sewer with large amounts of water.
Federal, state, and local regulations take precedence.

SECTION X. ENVIRONMENTAL EFFECTS DATA

A. SUMMARY:

This chemical formulation has not been tested for environmental effects. Some published data are available for the major components of this chemical formulation and these data have been used to provide the following estimate of environmental impact:[1]

This chemical formulation is a strongly acidic aqueous solution, and this property is the only one expected to cause adverse environment effects. This chemical formulation has a low biological oxygen demand, and it is expected to cause little oxygen depletion in aquatic systems. It is expected to have a low potential to affect aquatic organisms. The components of this chemical formulation are not likely to bioconcentrate. If diluted with a large amount of water, a moderate quantity of this chemical formulation released into the environment is not expected to have a significant impact.

SECTION XI. TRANSPORTATION

Transportation information may be obtained by requesting an EXTERNAL TRANSPORTATION ADDENDUM sheet by catalog number(s) from Kodak Publications Data Services, Eastman Kodak Company, 343 State Street, Rochester, New York 14650.

SECTION XII. REFERENCES

1. Battelle's Columbus Laboratories, Water Quality Critical Data Book - Vol. 3 - Effects of Chemicals on Aquatic Life - Selected Data from the Literature Through 1968, for the U.S. Environmental Protection Agency, Project No. 18050 GWV, Contract No. 68-01-007, May 1971.

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@146-4114*
@146-4106*
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@173-3013*
82-0041

CAT No. 186 5609
186 5567
186 5542
186 5500

MATERIAL SAFETY DATA SHEET

EASTMAN KODAK COMPANY
343 State Street
Rochester, New York 14650

For Emergency Health, Safety, and Environmental Information, call: (716) 722-5151
For all other purposes, call the Marketing and Distribution Center serving your area.

Date of Preparation: 8/18/82 Approved by U.S. Department of Labor

SECTION I. IDENTIFICATION

- Product Name: KODAK SII Activator
- Formula: Aqueous Mixture
- Formula Date: 7/27/82
- Kodak Photographic Chemicals Catalog Number(s): CAT 186 5609 - 1 Quart; CAT 186 5567 - 2 1/2 Gallons; CAT 186 5542 - 5 Gallons; CAT 186 5500 - 30 Gallons
- Solution Number: 554
- Kodak Accession Number: 354587
- *Kodak Hazard Rating Codes: R: 1 S: 3 F: 0 C: 0

*The Kodak Health Hazard Rating Code for Respiratory (R) exposure and Skin and Eye (S) exposure is on a scale of Low = 1; Moderate = 2; and High = 3. The Kodak Fire (F) and Reactivity (C) Hazard Codes are on an ascending scale from 0 to 4. F denotes relative flammability and C denotes relative reactivity or instability. Subcategories of C: (W) - water reactive, (A) - pyrophoric, (X) - oxidizer.

DO NOT CONFUSE WITH NFPA CODES!

SECTION II. PRODUCT AND COMPONENT HAZARD DATA

A. COMPONENT(S):

	Percent	TLV*	Kodak Accession No.	CAS Reg. No.
Water	80-90	---	035290	7732-18-5
*Potassium hydroxide	5-10	2 mg/m^3 Ceiling	901383	1310-58-3
Alkali sulfite	5-10	---	---	---

[*Principal Hazardous Component(s)]

B. PRECAUTIONARY LABEL STATEMENT(S):

WARNING! Causes eye burns.
Causes skin irritation.
Do not get in eyes.
Avoid prolonged or repeated contact with skin.
In case of contact, immediately flush with plenty of water; for eyes, get medical attention.
Note to physician: Caustic solution. Treat accordingly.

SECTION III. PHYSICAL DATA

- Appearance and Odor: Clear, colorless solution; odorless
- Boiling Point: > 100 °C (> 212 °F) @ 760 mmHg
- Vapor Pressure: ∿ 17 mmHg @ 20 °C
- Vapor Density (Air = 1): ∿ 0.6
- Volatile Fraction by Weight: ∿ 87 %
- Specific Gravity (H_2O = 1): 1.11
- pH: > 13.0
- Solubility in Water (by Weight): Complete

SECTION IV. FIRE AND EXPLOSION HAZARD DATA

- Flash Point: None
- Flammable Limits in Air (% by volume in air): None
- Extinguishing Media: Not Applicable
- Special Fire Fighting Procedures: None
- Unusual Fire and Explosion Hazards: None

SECTION V. REACTIVITY DATA

- Stability: Stable
- Incompatibility: Avoid strong mineral acids.
- Hazardous Decomposition Products: Sulfur dioxide
- Hazardous Polymerization: Will not occur.

SECTION VI. TOXICITY AND HEALTH HAZARD DATA

A. THRESHOLD LIMIT VALUE: See Section II

B. EXPOSURE EFFECTS:

Eyes: Causes eye burns.

Skin: Prolonged or repeated skin contact can cause skin irritation and/or burns.

C. FIRST AID:

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes and get medical attention.

Skin: Immediately flush skin with plenty of water for at least 15 minutes and get medical attention if symptoms are present after washing.
Remove contaminated clothing.
Launder contaminated clothing before reuse.

Note to Physicians: Caustic solution. Treat accordingly.

SECTION VII. PERSONAL PROTECTION AND CONTROLS

A. RESPIRATORY PROTECTION: None should be needed.

B. VENTILATION:

Local Exhaust: None should be needed.

Mechanical (General): Recommended

C. SKIN AND EYE PROTECTION:

Protective gloves should be worn.
Safety glasses with side shields or goggles are recommended.

SECTION VIII. SPECIAL STORAGE AND HANDLING PRECAUTIONS

Keep away from strong mineral acids.

SECTION IX. SPILL, LEAK, AND DISPOSAL PROCEDURES

Wear suitable protective equipment.
Neutralize with sodium bisulfate.
Flush material to sewer with large amounts of water.
Federal, state, and local regulations take precedence.

SECTION X. ENVIRONMENTAL EFFECTS DATA

A. SUMMARY:

This chemical formulation has not been tested for environmental effects. Some laboratory test data and published data are available for the major components of this chemical formulation, and these data have been used to provide the following estimate of environmental impact:[1,2,3]

This chemical formulation is a strongly alkaline aqueous solution, and this property is the only one expected to cause adverse environment effects. This chemical formulation has a low biological oxygen demand, and it is expected to cause little oxygen depletion in aquatic systems. It is expected to have a low potential to affect aquatic organisms, secondary waste treatment microorganisms, and the germination and growth of some plants. The components of this chemical formulation are not likely to bioconcentrate. If diluted with a large amount of water, a moderate quantity of this chemical formulation released into the environment is not expected to have a significant impact.

SECTION XI. TRANSPORTATION

Transportation information may be obtained by requesting an EXTERNAL TRANSPORTATION ADDENDUM sheet by catalog number(s) from Kodak Publications Data Services, Eastman Kodak Company, 343 State Street, Rochester, New York 14650.

SECTION XII. REFERENCES

1. Unpublished Data. Health, Safety, and Human Factors Laboratory. Eastman Kodak Company, Rochester, New York.

2. Battelle's Columbus Laboratories, Water Quality Critical Data Book - Vol. 3 - Effects of Chemicals on Aquatic Life - Selected Data from the Literature Through 1968, for the U.S. Environmental Protection Agency, Project No. 18050 GWV, Contract No. 68-01-007, May 1971.

3. Kodak Publication J-41, BOD_5 and COD of Photographic Chemicals, Eastman Kodak Co., 1981.

The information contained herein is furnished without warranty of any kind. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of the suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers.

@186-5500*
@186-5542*
@186-5567*
@186-5609*
81-0219

MATERIAL SAFETY DATA SHEET

EASTMAN KODAK COMPANY
343 State Street
Rochester, New York 14650

For Emergency Health, Safety, and Environmental Information, call: (716) 722-0271.

Date of Preparation: 5/28/82

SECTION I. IDENTIFICATION

- Product Name: KODAK SII Deactivator (Ready-to-Use)
- Formula: Aqueous Mixture
- Formula Date: 8/31/81
- Kodak Photographic Chemicals Catalog Number(s): CAT 139 6878 - 1 Quart; CAT 124 3161 - 5 Gallons; CAT 139 6894 - 2 1/2 Gallons; CAT 139 6746 - 30 Gallons
- Solution Number: 4270
- Kodak Accession Number: 365592
- *Kodak Hazard Rating Codes: R: 1 S: 1 F: 0 C: 0

*The Kodak Health Hazard Rating Code for Respiratory (R) exposure and Skin and Eye (S) exposure is on a scale of Low = 1; Moderate = 2; and High = 3. The Kodak Fire (F) and Reactivity (C) Hazard Codes are on an ascending scale from 0 to 4. F denotes relative flammability and C denotes relative reactivity or instability. Subcategories of C: (W) - water reactive, (A) - pyrophoric, (X) - oxidizer.

DO NOT CONFUSE WITH NFPA CODES!

SECTION II. PRODUCT AND COMPONENT HAZARD DATA

A. COMPONENT(S):

COMPONENT(S):	Percent	TLV•	Kodak Accession No.	CAS Reg. No.
Water	55-65	---	035290	7732-18-5
Ammonium thiocyanate	15-25	---	900433	1762-95-4
Sodium acetate	5-15	---	900227	127-09-3

B. PRECAUTIONARY LABEL STATEMENT(S):

No health hazard warning language is needed on the containers.

SECTION III. PHYSICAL DATA

- Appearance and Odor: Colorless to light pink solution; slight sulfur dioxide odor
- Boiling Point: > 100 °C (> 212 °F) @ 760 mmHg
- Vapor Pressure: ∿ 17 mmHg @ 20 °C
- Evaporation Rate (n-butyl acetate = 1): Not Applicable
- Vapor Density (Air = 1): ∿ 0.6
- Volatile Fraction by Weight: ∿ 65 %
- Specific Gravity (H_2O = 1): 1.15
- pH: ∿ 4.4
- Solubility in Water (by Weight): Complete

SECTION IV. FIRE AND EXPLOSION HAZARD DATA

- Flash Point: None
- Flammable Limits in Air (% by volume in air): None
- Extinguishing Media: Not Applicable
- Special Fire Fighting Procedures: None
- Unusual Fire and Explosion Hazards: None

SECTION V. REACTIVITY DATA

- Stability: Stable
- Incompatibility: Avoid high heat, mineral acids.
- Hazardous Decomposition Products:
  As with any other organic material, combustion will produce carbon dioxide and probably carbon monoxide.
  Oxides of nitrogen and sulfur dioxide may also be present.
- Hazardous Polymerization: Will not occur.

SECTION VI. TOXICITY AND HEALTH HAZARD DATA

A. THRESHOLD LIMIT VALUE: Not Applicable

B. EXPOSURE EFFECTS: Low hazard

C. FIRST AID: In case of contact, flush areas with plenty of water.

SECTION VII. PERSONAL PROTECTION AND CONTROLS

A. RESPIRATORY PROTECTION: None should be needed.

B. VENTILATION:

Local Exhaust: None should be needed.

Mechanical (General): Recommended

C. SKIN AND EYE PROTECTION:

None should be needed, but good industrial hygiene practice should be followed.

SECTION VIII. SPECIAL STORAGE AND HANDLING PRECAUTIONS

No special precautions are needed.

SECTION IX. SPILL, LEAK, AND DISPOSAL PROCEDURES

Flush material to sewer with large amounts of water.
Wash area with soap and water.
Federal, state, and local regulations take precedence.

SECTION X. ENVIRONMENTAL EFFECTS DATA

A. SUMMARY:

This chemical formulation has not been tested for environmental effects. Some laboratory test data and published data are available for the major components of this chemical formulation, and these data have been used to provide the following estimate of environmental impact:[1,2,3]

This chemical formulation has a moderate biological oxygen demand, and it is expected to cause some oxygen depletion in aquatic systems. It is expected to have a low potential to affect aquatic organisms, secondary waste treatment microorganisms and the germination and growth of some plants. The components of this chemical formulation are not likely to bioconcentrate. If diluted with a large amount of water, a small quantity of this chemical formulation released into the environment is not expected to have a significant impact.

SECTION XI. TRANSPORTATION

Transportation information may be obtained by requesting an EXTERNAL TRANSPORTATION ADDENDUM sheet by catalog number(s) from Kodak Publications Data Services, Eastman Kodak Company, 343 State Street, Rochester, New York 14650.

SECTION XII. REFERENCES

1. Unpublished Data. Health, Safety, and Human Factors Laboratory. Eastman Kodak Company, Rochester, New York.

2. Verschueren, K., Handbook of Environmental Data on Organic Chemicals, Van Nostrand Reinhold Company, New York, N.Y., 1977.

3. Battelle's Columbus Laboratories, Water Quality Critical Data Book - Vol. 3 - Effects of Chemicals on Aquatic Life - Selected Data from the Literature Through 1968, for the U.S. Environmental Protection Agency, Project No. 18050 GWV, Contract No. 68-01-007, May 1971.

The information herein is believed to be correct as of the date hereof, but is provided without warranty of any kind.

@139-6894*
@139-6878*
@124-3161*
@139-6746*
81-0152

CAT 146 4734

MATERIAL SAFETY DATA SHEET

EASTMAN KODAK COMPANY
343 State Street
Rochester, New York 14650

For Emergency Health, Safety, and Environmental Information, call (716) 722-5151
For all other purposes, call the Marketing and Distribution Center in your area.

Date of Preparation: 12/17/82 Approved by U.S. Department of Labor

SECTION I. IDENTIFICATION

- Product Name: KODAK DEKTOL Developer (Single Powder)
- Formula: Solid Mixture
- Formula Date: 1/29/82
- Kodak Photographic Chemicals Catalog Number(s): CAT 146 4734 - To Make 5 Gallons
- Mixture Number: 224
- Kodak Accession Number: 354538

SECTION II. PRODUCT AND COMPONENT HAZARD DATA

A. COMPONENT(S):

	Percent	TLV•	Kodak Accession No.	CAS Reg. No.
Sodium carbonate, monohydrate	40-60	---	900860	5968-11-6
Sodium sulfite	20-40	---	901148	7757-83-7
*Hydroquinone	5-10	2 mg/m^3	900356	123-31-9
*p-Methylaminophenol sulfate	< 5	---	900615	55-55-0

[*Principal Hazardous Component(s)]

B. PRECAUTIONARY LABEL STATEMENT(S):

Contains hydroquinone and p-methylaminophenol sulfate
CAUTION! May cause skin and eye irritation and allergic skin reaction.
Avoid contact with skin and eyes.
Avoid breathing dust.

SECTION III. PHYSICAL DATA

- Appearance and Odor: White powder; odorless
- Boiling Point: Not Applicable
- Vapor Pressure: Negligible
- Evaporation Rate (n-butyl acetate = 1): Not Applicable
- Vapor Density (Air = 1): Not Applicable
- Volatile Fraction by Weight: Negligible
- Specific Gravity (H_2O = 1): Not Applicable
- pH: Not Applicable
- Solubility in Water (by Weight): Appreciable

SECTION IV. FIRE AND EXPLOSION HAZARD DATA

- Flash Point: None
- Flammable Limits in Air (% by volume in air): None
- Extinguishing Media: Not Applicable
- Special Fire Fighting Procedures: None
- Unusual Fire and Explosion Hazards: None

SECTION V. REACTIVITY DATA

- Stability: Stable
- Incompatibility: Avoid mineral acids.
- Hazardous Decomposition Products:
  As with any other organic material, combustion will produce carbon dioxide and probably carbon monoxide.
  Sulfur dioxide
- Hazardous Polymerization: Will not occur.

SECTION VI. TOXICITY AND HEALTH HAZARD DATA

A. THRESHOLD LIMIT VALUE: See Section II

B. EXPOSURE EFFECTS:

Eyes: Contact with the powder may cause eye irritation.

Skin: Prolonged or repeated skin contact may cause skin irritation and may result in an allergic skin reaction.

C. FIRST AID:

Eyes: Immediately flush eyes with plenty of water and get medical attention.

Skin: Flush skin with plenty of water.
If skin irritation or an allergic skin reaction develops, get medical attention.

D. ANIMAL TOXICITY DATA

Test	Species	Result(1)	Classification(2)
Oral LD_{50}	Rat	0.5 - 5.0 g/kg	Slighlty toxic
Skin Irritation (24h)	Guinea Pig	Slight-Moderate irritation	

SECTION VII. PERSONAL PROTECTION AND CONTROLS

A. RESPIRATORY PROTECTION: None should be needed

B. VENTILATION:

Local Exhaust: None should be needed

Mechanical (General): Recommended

C. SKIN AND EYE PROTECTION:

Protective gloves should be worn.
Safety glasses should be worn.
The routine use of a non-alkaline (acid) type of hand cleaner will help minimize the possibility of allergic skin reaction.

SECTION VIII. SPECIAL STORAGE AND HANDLING PRECAUTIONS

Keep dry.

SECTION IX. SPILL, LEAK, AND DISPOSAL PROCEDURES

Avoid eye and skin contact.
Wear suitable protective equipment.
Flush to an acid-free sewer with large amounts of water.
The direct instantaneous discharge to a receiving body of water of an amount of this chemical formulation which will rapidly produce, by dilution, a final concentration of 0.01 mg/L or less is not expected to cause an adverse environmental effect.
Federal, state, and local regulations take precedence.

SECTION X. ENVIRONMENTAL EFFECTS DATA

A. SUMMARY:

This chemical formulation has not been tested for environmental effects. Some laboratory test data and published data are available for the major components of this chemical formulation, and these data have been used to provide the following estimate of environmental impact:[1,3,4,5,6]

This chemical formulation has a high biological oxygen demand, and it is expected to cause significant oxygen depletion in aquatic systems. It is expected to have a high potential to affect aquatic organisms, secondary waste treatment microorganisms, and the germination and growth of some plants. The components of this chemical formulation are expected to be biodegradable and are not likely to bioconcentrate. The direct instantaneous discharge to a receiving body of water of an amount of this chemical formulation which will rapidly produce, by dilution, a final concentration of 0.01 mg/L or less is not expected to cause an adverse environmental effect. However, after dilution with a large amount of water, followed by secondary waste treatment, the chemicals in this formulation are not expected to have any adverse environmental impact.

SECTION XI. TRANSPORTATION

Transportation information may be obtained by requesting an EXTERNAL TRANSPORTATION ADDENDUM sheet by catalog number(s) from Kodak Publications Data Services, Eastman Kodak Company, 343 State Street, Rochester, New York 14650.

SECTION XII. REFERENCES

1. Unpublished Data. Health, Safety, and Human Factors Laboratory. Eastman Kodak Company, Rochester, New York.

2. Hodge, H.C., and Sterner, J.H., Am. Indust. Hyg. Assn. Quart. 10:93, 1949.

3. Verschueren, K., Handbook of Environmental Data on Organic Chemicals, Van Nostrand Reinhold Company, New York, N.Y., 1977.

4. Battelle's Columbus Laboratories, Water Quality Critical Data Book - Vol. 3 - Effects of Chemicals on Aquatic Life - Selected Data from the Literature Through 1968, for the U.S. Environmental Protection Agency, Project No. 18050 GWV, Contract No. 68-01-007, May 1971.

5. National Association of Photographic Manufacturers, Inc. and Hydroscience, Inc., Environmental Effects of Photoprocessing Chemicals, National Association of Photographic Manufacturers, Harrison, New York, 1974, 2 vols.

6. Kodak Publication J-41, BOD_5 and COD of Photographic Chemicals, Eastman Kodak Co., 1981.

The information contained herein is furnished without warranty of any kind. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of the suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers.

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44-R1387

MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
ACUFINE, INC.	(312) 321-0240
ADDRESS (Number, Street, City, State, and ZIP Code): 439 E. Illinois St., Chicago, IL. 60611	
CHEMICAL NAME AND SYNONYMS	TRADE NAME AND SYNONYMS: ACUFINE FILM DEVELOPER
CHEMICAL FAMILY: Principally carbonates, sod. sulfite	FORMULA

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS — Not applicable		
VEHICLE — Not applicable			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)
Only chemical in mixture shown on OSHA list of Toxic and hazardous		
materials is Hydroquinone.		
Hydroquinone	3	2*
* Mg/M, Approximate miligrams of particulate per cubic meter of air.		

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	Decomposes	SPECIFIC GRAVITY (H_2O=1)	2.83
VAPOR PRESSURE (mm Hg.)	Negligible	PERCENT, VOLATILE BY VOLUME (%)	N/A
VAPOR DENSITY (AIR=1)	N/A	EVAPORATION RATE (_____ =1)	N/A
SOLUBILITY IN WATER	17% @ 10°C		
APPEARANCE AND ODOR	White powder No odor		

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	FLAMMABLE LIMITS	Lel	Uel
Non-Flammable			

EXTINGUISHING MEDIA: N/A

SPECIAL FIRE FIGHTING PROCEDURES: Wear self contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Excessive heat may cause production of hazardous decomposition products.

(Continued on reverse side)

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE
2 for Hydroquinone as per reverse side.

EFFECTS OF OVEREXPOSURE
Repeated contact may cause skin irritation and allergic skin reactions.

EMERGENCY AND FIRST AID PROCEDURES
If swallowed induce vomiting, call a physician at once. Inhalation, remove to fresh air. Eyes, flush with water. Skin, flush with water and wash with non-alkaline type cleanser.

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	

INCOMPATABILITY *(Materials to avoid)*

HAZARDOUS DECOMPOSITION PRODUCTS

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Sweep up if dry. Wipe up if wet.

WASTE DISPOSAL METHOD
Flush material to an acid free sewer with large amounts of water.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION *(Specify type)*
A NIOSH approved dust respirator should be worn in dusty or misty air.

VENTILATION	LOCAL EXHAUST: Regular	SPECIAL: Nothing special
	MECHANICAL *(General)*: Good general	OTHER

PROTECTIVE GLOVES: Impervious where repeated skin contact exists.

EYE PROTECTION: Chemical safety glasses

OTHER PROTECTIVE EQUIPMENT
None

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Keep container tightly closed and away from acids.

OTHER PRECAUTIONS

C-27

EASTMAN KODAK COMPANY
APPROVED BY U.S. DEPARTMENT OF LABOR
"ESSENTIALLY SIMILAR" TO FORM OSHA-20

MATERIAL SAFETY DATA SHEET

0225

SECTION I

PRODUCT NAME: KODAK Developer D-76 | SIZE: To make 1 qt., 1/2, 1 gal.

CHEMICAL NAME: N. A.*

FORMULA: Solid mixture

MANUFACTURER: Eastman Kodak Company

ADDRESS: 343 State Street, Rochester, New York 14650

FOR INFORMATION ON HEALTH HAZARDS CALL: 716-458-1000 Ext. 85566

FOR OTHER INFORMATION CALL: (716) 722-2121 INFORMATION EFFECTIVE AS OF: 10-21-75

SECTION II HAZARDOUS INGREDIENTS OF MIXTURES

PRINCIPAL HAZARDOUS COMPONENT (S)	%	TLV (Units)
Hydroquinone	1 - 6	2 mg/m^3
p-Methylaminophenol Sulfate	1 - 6	-------

SECTION III PHYSICAL DATA

BOILING POINT (°F.)	N. A.	SPECIFIC GRAVITY (H_2O=1)	Greater than 1
VAPOR PRESSURE (mm Hg.)	Negligible	PERCENT VOLATILE BY VOLUME (%)	Negligible
VAPOR DENSITY (AIR=1)	N. A.	EVAPORATION RATE (_____=1)	N. A.
SOLUBILITY IN WATER	Appreciable		
APPEARANCE AND ODOR	Clear to slightly yellow - no odor		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	FLAMMABLE LIMITS	Lel	Uel
None	None		

EXTINGUISHING MEDIA Not flammable

SPECIAL FIRE FIGHTING PROCEDURES

None

UNUSUAL FIRE AND EXPLOSION HAZARDS

:: :licable

SECTION V HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE

EFFECTS OF OVEREXPOSURE

Repeated contact with skin may cause irritation and allergic skin reaction.

EMERGENCY AND FIRST AID PROCEDURES

In case of contact, flush with plenty of water.

SECTION VI REACTIVITY DATA

STABILITY			CONDITIONS TO AVOID
	UNSTABLE		
	STABLE	X	

INCOMPATIBILITY (Materials to avoid) None

HAZARDOUS DECOMPOSITION PRODUCTS None

HAZARDOUS POLYMERIZATION		CONDITIONS TO AVOID
May Occur	Will Not Occur	
	X	

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN CASE MATERIAL IS RELEASED OR SPILLED: Flush down sewer. State and local effluent laws take precedence.

WASTE DISPOSAL METHOD

Flush down sewer. State and local effluent laws take precedence.

SECTION VIII SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type) An approved dust respirator for large volume handling

VENTILATION				
	LOCAL EXHAUST	Yes	SPECIAL	No
	MECHANICAL (general)	Yes	OTHER	No

PROTECTIVE GLOVES: Yes

EYE PROTECTION: No

OTHER PROTECTIVE EQUIPMENT: No

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

None

OTHER PRECAUTIONS

The routine use of a non-alkaline (acid) type hand cleaner will help minimize the possibility of allergic skin reaction.

PMT

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44-R1387

MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
ALTA CHEMICAL CORPORATION	(619) 453-5010

ADDRESS *(Number, Street, City, State, and ZIP Code)*: 11526-F Sorrento Valley Road, San Diego, CA 92121

CHEMICAL NAME AND SYNONYMS	TRADE NAME AND SYNONYMS
DD, DD-2.5, DD-5 Diffusion Transfer Developer	

CHEMICAL FAMILY	FORMULA
AQUEOUS PHOTO PROCESSING SOLUTION	R1-183-01043

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS		n/a	BASE METAL		n/a
CATALYST		n/a	ALLOYS		n/a
VEHICLE		n/a	METALLIC COATINGS		n/a
SOLVENTS		n/a	FILLER METAL PLUS COATING OR CORE FLUX		n/a
ADDITIVES		n/a	OTHERS		n/a
OTHERS		n/a			

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)
n/a		

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	approx. 213°F		SPECIFIC GRAVITY (H_2O=1)	1.08
VAPOR PRESSURE (mm Hg.)	approx. 18		PERCENT, VOLATILE BY VOLUME (%)	88%
VAPOR DENSITY (AIR=1)	approx. 1		EVAPORATION RATE (H_2O =1)	approx. 1
SOLUBILITY IN WATER	compl.			

APPEARANCE AND ODOR: Clear, colorless, odorless solution.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	FLAMMABLE LIMITS	Lel	Uel
none			

EXTINGUISHING MEDIA: n/a

SPECIAL FIRE FIGHTING PROCEDURES: n/a

UNUSUAL FIRE AND EXPLOSION HAZARDS: none

(Continued on reverse side)

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE

n/a

EFFECTS OF OVEREXPOSURE

n/a

EMERGENCY AND FIRST AID PROCEDURES

Wash skin and eyes if contacted. Prescribe emetics to cause vomiting if ingested.

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	

INCOMPATABILITY *(Materials to avoid)*

n/a

HAZARDOUS DECOMPOSITION PRODUCTS

n/a

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Wash with plenty of water.

WASTE DISPOSAL METHOD

To normal sanitary sewer.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION *(Specify type)*

none

VENTILATION	LOCAL EXHAUST: normal air circulation	SPECIAL
	MECHANICAL *(General)*	OTHER

PROTECTIVE GLOVES: optional	EYE PROTECTION: goggles recommended

OTHER PROTECTIVE EQUIPMENT

none

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Avoid undue skin contact. Employ normal cleanliness.

OTHER PRECAUTIONS

Do not swallow.

Form OSHA-20
Rev. May 72

ORIGINAL

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44-R1387

MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
TKO CHEMICAL COMPANY	(816) 232-7194
ADDRESS (Number, Street, City, State, and ZIP Code) 401 Angelique Street, St. Joseph, Missouri 64501	
CHEMICAL NAME AND SYNONYMS N/A	TRADE NAME AND SYNONYMS Orbit Bath
CHEMICAL FAMILY Compound Product	FORMULA N/A Propriatary

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)
This product is not classified as a "Hazardous Material" in normal use		
as defined in U. S. Department of Labor Regulations 29 CFR 1915.2,		
1916.2 and 1917.2. This product does not contain hazardous substances		
according to Federal and State Hazardous Communication Standards.		

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	212°F	SPECIFIC GRAVITY (H_2O=1)	1.02
VAPOR PRESSURE (mm Hg.)	N/A	PERCENT, VOLATILE BY VOLUME (%)	96.3%
VAPOR DENSITY (AIR=1)	N/A	EVAPORATION RATE (_____ =1)	N/A
SOLUBILITY IN WATER	Complete		
APPEARANCE AND ODOR	Clear		

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	FLAMMABLE LIMITS	Lel	Uel
None			
EXTINGUISHING MEDIA N/A			
SPECIAL FIRE FIGHTING PROCEDURES N/A			
UNUSUAL FIRE AND EXPLOSION HAZARDS None			

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE

EFFECTS OF OVEREXPOSURE

Product is slight eye irritant.

EMERGENCY AND FIRST AID PROCEDURES

In case of contact, flush with water. If irritation persists call a physician.

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	XX	

INCOMPATABILITY *(Materials to avoid)*

HAZARDOUS DECOMPOSITION PRODUCTS

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	XX	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Flush to drain.

WASTE DISPOSAL METHOD

Dispose of in accordance with local ordinance.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION *(Specify type)*

N/A

VENTILATION	LOCAL EXHAUST N/A	SPECIAL
	MECHANICAL *(General)* N/A	OTHER

PROTECTIVE GLOVES N/A	EYE PROTECTION N/A

OTHER PROTECTIVE EQUIPMENT

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

No specific cautions necessary.

OTHER PRECAUTIONS

MATERIAL SAFETY DATA SHEET

EASTMAN KODAK COMPANY
343 State Street
Rochester, New York 14650

For Emergency Health, Safety, and Environmental Information, call (716) 722-5151
For all other purposes, call the Marketing and Distribution Center in your area.

Revised Date of Preparation: 9/27/84 Approved by U.S. Department of Labor

SECTION I. IDENTIFICATION

- Product Name: KODAK PHOTO-FLO 200 Solution
- Formula: Aqueous Mixture
- Kodak Photographic Chemicals Catalog Number(s): CAT 146 4502 - 4 Fluid ounces; CAT 146 4510 - 16 Fluid ounces
- Solution Number: 3107
- Kodak Accession Number: 354804

SECTION II. PRODUCT AND COMPONENT HAZARD DATA

A. COMPONENT(S):	Weight Percent	TLV*	Kodak Accession No.	CAS Reg. No.
Water	60-70	---	035290	7732-18-5
Propylene glycol	25-30	---	901321	57-55-6
*p-Tertiary-octylphenoxy polyethyl alcohol	5-10	---	913075	9002-93-1

*Principal Hazardous Component(s)

B. PRECAUTIONARY LABEL STATEMENT(S):

Contains p-tertiary-octylphenoxy polyethyl alcohol
WARNING!
CAUSES EYE IRRITATION
Avoid contact with eyes.
First Aid: In case of eye contact, immediately flush with plenty of water for at least 15 minutes. Get medical attention. KEEP OUT OF REACH OF CHILDREN.

SECTION III. PHYSICAL DATA

- Appearance and Odor: Colorless solution; odorless
- Boiling Point: > 100 °C (> 212 °F) @ 760 mmHg
- Vapor Pressure: ~ 18 mmHg @ 20 °C
- Evaporation Rate (n-butyl acetate = 1): Not Available
- Vapor Density (Air = 1): ~ 0.6
- Volatile Fraction by Weight: ~ 65 %
- Specific Gravity (H_2O = 1): 1.03
- pH: ~ 7.0
- Solubility in Water (by Weight): Complete

SECTION IV. FIRE AND EXPLOSION HAZARD DATA

- Flash Point: None
- Extinguishing Media: Water spray, Dry chemical, CO_2
- Special Fire Fighting Procedures:
  Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
- Unusual Fire and Explosion Hazards: None

SECTION V. REACTIVITY DATA

- Stability: Stable
- Incompatibility: Strong oxidizers
- Hazardous Decomposition Products:
  As with any other organic material, combustion will produce carbon dioxide and probably carbon monoxide.
- Hazardous Polymerization: Will not occur.

SECTION VI. TOXICITY AND HEALTH HAZARD DATA

A. THRESHOLD LIMIT VALUE: Not Applicable

B. EXPOSURE EFFECTS:

Eyes: Causes eye irritation.

C. FIRST AID:

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes and get medical attention.

D. TOXICITY DATA

Test	Species	Result[1]	Classification[2]
Acute Oral LD_{50}	Rat	5000 mg/kg	Practically non-toxic
Skin Irritation	Guinea Pig	Slight irritation	
Eye Irritation	Rabbit	Moderate irritation	

SECTION VII. PERSONAL PROTECTION AND CONTROLS

A. RESPIRATORY PROTECTION: None should be needed.

B. VENTILATION:

Local Exhaust: None should be needed.

Mechanical (General): Recommended

C. SKIN AND EYE PROTECTION: Safety glasses should be worn.

SECTION VIII. SPECIAL STORAGE AND HANDLING PRECAUTIONS

Keep from contact with oxidizing materials.

SECTION IX. SPILL, LEAK, AND DISPOSAL PROCEDURES

Flush material to sewer with large amounts of water.
Discharge, treatment, or disposal may be subject to federal, state, or local laws.

X. ENVIRONMENTAL EFFECTS DATA

A. SUMMARY:

This chemical formulation has not been tested for environmental effects. Some laboratory test data and published data are available for the major components of this chemical formulation, and these data have been used to provide the following estimate of environmental impact:[1,2,3,4]

This chemical formulation has a moderate biological oxygen demand, and it is expected to cause some oxygen depletion in aquatic systems. It is expected to have a moderate potential to affect aquatic organisms. It is expected to have a low potential to affect secondary waste treatment microorganisms. If diluted with a large amount of water, a moderate quantity of this chemical formulation released into the environment is not expected to have a significant impact.

SECTION XI. TRANSPORTATION

For transportation information regarding this product, please phone the Eastman Kodak Distribution Center nearest you: Rochester, NY (716) 254-1300; Oak Brook, IL (312) 654-5300; Chamblee, GA (404) 455-0123; Dallas, TX (214) 241-1611; Whittier, CA (213) 945-1255; Honolulu, HI (808) 833-1661.

SECTION XII. REFERENCES

1. Unpublished data, Health and Environment Laboratories, Eastman Kodak Company, Rochester, New York.

2. Hodge, H.C., and Sterner, J.H., Am. Indust. Hyg. Assn. Quart. 10:93, 1949.

3. Verschueren, K., Handbook of Environmental Data on Organic Chemicals, Van Nostrand Reinhold Company, New York, N.Y., 1977.

4. Maeck, W.J. and Krzeminski, S.F., Bulletin of Environmental Contamination and Toxicology, 13 (3), 377-84 (1975)

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U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44-R1387

MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
Hurst Graphics, Inc.	(213) 223=4121

ADDRESS (Number, Street, City, State, and ZIP Code)
2500 San Fernando Road, Los Angeles, Calif. 90065

CHEMICAL NAME AND SYNONYMS	TRADE NAME AND SYNONYMS
Hurst No. 319	Stabilization Processor
CHEMICAL FAMILY: Acidic degreaser	FORMULA: N/A — Cleaner Concentrate

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)
Organic levels (in concentrate)	50	

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	216	SPECIFIC GRAVITY (H_2O=1)	1.150
VAPOR PRESSURE (mm Hg.)	17	PERCENT, VOLATILE BY VOLUME (%)	50
VAPOR DENSITY (AIR=1)	1.0	EVAPORATION RATE (Water ___ =1)	
SOLUBILITY IN WATER	100		

APPEARANCE AND ODOR: Clear, red, no odor

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	FLAMMABLE LIMITS	Lel	Uel
Non-flammable	N/A		

EXTINGUISHING MEDIA: N/A

SPECIAL FIRE FIGHTING PROCEDURES: N/A

UNUSUAL FIRE AND EXPLOSION HAZARDS: N/A

(Continued on reverse side)

NOTICE: HURST GRAPHICS furnishes Material Safety Data Sheets based on information from its raw material suppliers. HURST GRAPHICS does not guarantee the accuracy of the data therein, nor assume liability of any kind in releasing Material Safety Data Sheets. Caution is advised with regard to Threshold Limit Value (TLV), because these values are constantly being revised (both higher and lower).

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE

N/A

EFFECTS OF OVEREXPOSURE

Organic acid portion of concentrate may cause burns. Contact with skin and eyes should be avoided.

EMERGENCY AND FIRST AID PROCEDURES

In case of contact with concentrate, immediately flush skin or eyes with plenty of water for at least 15 minutes; for eyes, get medical attention.

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	

INCOMPATABILITY *(Materials to avoid)*

Strong alkali.

HAZARDOUS DECOMPOSITION PRODUCTS

Thermal decomposition may yield carbon monoxide.

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Remove by mopping with plenty of soap and water. If spill is large, absorb in Bicarbonate of Soda before removal.

WASTE DISPOSAL METHOD

Standard waste sump.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION *(Specify type)*

N/A

VENTILATION	LOCAL EXHAUST	SPECIAL
	MECHANICAL *(General)* N/A	OTHER

PROTECTIVE GLOVES	EYE PROTECTION
Rubber gloves recommended	Recommend goggles.

OTHER PROTECTIVE EQUIPMENT

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Leave in container supplied except when in use. Avoid contact with skin and eyes.

OTHER PRECAUTIONS

Composition Area

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44-R1387

MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
ALTA CHEMICAL CORPORATION	(619) 453-5010
ADDRESS (Number, Street, City, State, and ZIP Code) 11526-F Sorrento Valley Road, San Diego, CA 92121	
CHEMICAL NAME AND SYNONYMS NGS RCD-5, RCD-55 Developer & Replenisher	TRADE NAME AND SYNONYMS
CHEMICAL FAMILY AQUEOUS PHOTO PROCESSING SOLUTION	FORMULA 103-62

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS		n/a	BASE METAL		n/a
CATALYST		n/a	ALLOYS		n/a
VEHICLE		n/a	METALLIC COATINGS		n/a
SOLVENTS		n/a	FILLER METAL PLUS COATING OR CORE FLUX		n/a
ADDITIVES		n/a	OTHERS		n/a
OTHERS		n/a			
HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES				%	TLV (Units)
		n/a			

THIS SHEET PROVIDED FOR INFORMATION ONLY NOT REQUIRED BY OSHA

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	approx.	200°F	SPECIFIC GRAVITY (H_2O=1)	1.27
VAPOR PRESSURE (mm Hg.)	approx.	18	PERCENT, VOLATILE BY VOLUME (%)	65%
VAPOR DENSITY (AIR=1)	approx.	1	EVAPORATION RATE (___H_2O___ =1) approx.	1
SOLUBILITY IN WATER		compl.		
APPEARANCE AND ODOR	clear, colorless to tan solution: odorless			

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	none	FLAMMABLE LIMITS	Lel	Uel
EXTINGUISHING MEDIA	n/a			
SPECIAL FIRE FIGHTING PROCEDURES	n/a			
UNUSUAL FIRE AND EXPLOSION HAZARDS	none			

(Continued on reverse side)

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE	n/a
EFFECTS OF OVEREXPOSURE	n/a
EMERGENCY AND FIRST AID PROCEDURES	
Wash skin and eyes if contacted.	
Prescribe emetics to cause vomiting if ingested.	

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	x	
INCOMPATABILITY *(Materials to avoid)*	none		
HAZARDOUS DECOMPOSITION PRODUCTS	none		
HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	x	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Wash with plenty of water.
WASTE DISPOSAL METHOD
To normal sanitary sewer.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION *(Specify type)*	none	
VENTILATION	LOCAL EXHAUST: normal air circulation	SPECIAL
	MECHANICAL *(General)*	OTHER
PROTECTIVE GLOVES: optional	EYE PROTECTION: goggles recommended	
OTHER PROTECTIVE EQUIPMENT: none		

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Avoid undue skin contact. Employ normal cleanliness.
OTHER PRECAUTIONS
Do not swallow.

MATERIAL SAFETY DATA SHEET FOR PRESSURIZED PRODUCTS

SECTION I - PRODUCT IDENTIFICATION

COMPANY NAME SPRAYWAY, INC.	Regular Telephone Number: 312-628-0998 Emergency Telephone Number: 312-628-0998
ADDRESS 484 VISTA AVE., ADDISON, IL 60101	
PRODUCT TRADE NAME OR BRAND NAME SPRAYWAY FORMULA 40 GLASS CLENAER	
OTHER PRODUCT DESCRIPTION OR IDENTIFICATION	Cleaning Spray #83006

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENT CHEMCIAL NAME	Type of Hazard(s)	Approximate Weight %	TLV Value	Other Toxicity Information
Ethanol	Flammable	20	1000 ppm	OSHA TWA = 1000 ppm
2-Butoxy Ethanol	Minor Toxicity	5		OSHA TWA = 50 ppm
Hydrocarbon Propellant	Pressure Flammable	5		ACGIH TWA = 1000 ppm

SECTION III - PHYSICAL DATA

Boiling Point: NA	Specific Gravity: NA
Vapor Pressure (psig): 140 @ 130°F	Percent Volatiles by Volume (%): Approx. 100%
Vapor Density (AIR = 1): Greater	Evaporation Rate (n-Butyl Acetate = 1): Slower
Solubility in Water: Complete	
Appearance and Odor: Wide, hollow cone spray, semi-stable foam, solvent/ floral odor, no residue on wiping.	

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flash Point (minimum) Method: NA	Flammable Limits in Air Volume % NA
Extinguishing Media: NA	

SPECIAL FIREFIGHTING PROCEDURES: Keep containers cool. Use equipment or shielding as required to protect personnel against bursting, rupturing, or venting containers.

UNUSUAL FIRE AND EXPLOSION HAZARDS: At elevated temperatures (over 54°C=130°F) containers may vent, rupture, or burst.

PRODUCT TRADE NAME: _____

PRODUCT DESCRIPTION: _____

Unless noted otherwise, all information given is on the TOTAL PRODUCT, INCLUDING propellents.

Date Filled Out: 11/23/83 ; Prepared or Approved by: WD Gaston

Form #83006/12-83

PRODUCT BRAND NAME:

SECTION V - HEALTH HAZARD DATA

Threshold Limit Value (TLV): NA

EFFECTS OF OVEREXPOSURE: Excessive inhalation may cause nasal irritation. Eye contact causes temporary irritation, no damage if flushed. Excessive skin contact may cause irritation. Ingestion may cause irritation.

EMERGENCY AND FIRST AID PROCEDURES: If unconscious, remove victim to fresh air and call a physician. In case of eye contact, flush immediately with large amounts of water.
Low overall toxicity, but if large amounts are ingested, take to physician

SECTION VI - REACTIVITY DATA

Chemical Stability: Stable Conditions to avoid:

Incompatability (Materials to avoid): None

HAZARDOUS DECOMPOSITION PRODUCTS:
Carbon Monoxide at generally low levels.

Hazardous Polymerization: None

SECTION VII - LEAK AND DISPOSAL PROCEDURES

STEPS TO BE TAKEN IF CONTAINERS ARE LEAKING, OR LARGE AMOUNTS ARE RELEASED:
Flush to drain, or soak up with absorbant materials.

WASTE DISPOSAL METHOD: Do not puncture or incinerate containers. Give empty, leading or full containers to a disposal service equipped to safely handle and dispose of pressurized containers.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type): None, avoid excessive inhalation of vapors.

VENTILATION	LOCAL EXHAUST (Hoods, Fans, etc.): NA	
	MECHANICAL (General Area Ventilation): Should be on if spraying large amounts.	
PROTECTIVE GLOVES: None		EYE PROTECTION: None, do not spray toward eyes.

OTHER PROTECTIVE EQUIPMENT:
None, do not wear clothes soaked by spray.

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Do not store where temperatures could exceed 54°C (130°F).

OTHER PRECAUTIONS:

SPECIAL PRECAUTIONARY STATEMENTS: Please read and follow the directions on the product label; they are your best guide to using this product in the most effective way, and give the necessary safety precautions to protect your health.

Date Filled Out: 11/23/83 ;Prepared or Approved by: WD Gaston

The accuracy of data and information given on this form is not guaranteed, but it has been filled out to the best of our knowledge and belief. If you find any errors, or have any suggestions to improve the presentation, please contact us at the address given on the first page.

Form #83006/12-83

PRODUCT TRADE NAME: _____

PRODUCT DESCRIPTION: _____

Press Area

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44-R1387

MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
ALTA CHEMICAL CORPORATION	(619) 453-5010

ADDRESS (Number, Street, City, State, and ZIP Code)
11526-F Sorrento Valley Road, San Diego, CA 92121

CHEMICAL NAME AND SYNONYMS	TRADE NAME AND SYNONYMS
NGS RF-5, RF-20, RF-20-NH, RF-220 Liquid Rapid Fix (Concentrate I)	
CHEMICAL FAMILY: AQUEOUS PHOTO PROCESSING SOLUTION	FORMULA: HFA-475-4B

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS		n/a	BASE METAL		n/a
CATALYST		n/a	ALLOYS		n/a
VEHICLE		n/a	METALLIC COATINGS		n/a
SOLVENTS		n/a	FILLER METAL PLUS COATING OR CORE FLUX		n/a
ADDITIVES		n/a	OTHERS		n/a
OTHERS		n/a			
HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES				%	TLV (Units)

THIS SHEET PROVIDED FOR INFORMATION ONLY MSDS REQUIRED BY LAW

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	approx.	200°F	SPECIFIC GRAVITY (H_2O=1)		1.34
VAPOR PRESSURE (mm Hg.)	approx.	18	PERCENT, VOLATILE BY VOLUME (%)		60%
VAPOR DENSITY (AIR=1)	approx.	1	EVAPORATION RATE (H_2O =1)	approx.	1
SOLUBILITY IN WATER		compl.			
APPEARANCE AND ODOR	Clear, light yellow solution; slight acetic odor.				

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	none	FLAMMABLE LIMITS	Lel	Uel
EXTINGUISHING MEDIA	n/a			
SPECIAL FIRE FIGHTING PROCEDURES	n/a			
UNUSUAL FIRE AND EXPLOSION HAZARDS	none			

(Continued on reverse side)

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE	n/a
EFFECTS OF OVEREXPOSURE	n/a
EMERGENCY AND FIRST AID PROCEDURES	Wash eyes with plenty of water if contacted.
	Prescribe emetics to cause vomiting if ingested.

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	x	

INCOMPATABILITY *(Materials to avoid)*: Avoid strong acids.

HAZARDOUS DECOMPOSITION PRODUCTS: Sulfur dioxide

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	x	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Wash with plenty of water.

WASTE DISPOSAL METHOD

To normal sanitary sewer.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION *(Specify type)*: none

VENTILATION	LOCAL EXHAUST: Good air circulation	SPECIAL
	MECHANICAL *(General)*	OTHER

PROTECTIVE GLOVES: not required	EYE PROTECTION: no special requirements

OTHER PROTECTIVE EQUIPMENT: none

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Normal cleanliness

OTHER PRECAUTIONS

Do not swallow.

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Occupational Safety and Health Administration

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MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
ALTA CHEMICAL CORPORATION	(619) 453-5010
ADDRESS (Number, Street, City, State, and ZIP Code): 11526-F Sorrento Valley Road, San Diego, CA 92121	
CHEMICAL NAME AND SYNONYMS: NGS RFH Liquid Hardener	TRADE NAME AND SYNONYMS
CHEMICAL FAMILY: AQUEOUS PHOTO PROCESSING SOLUTION	FORMULA: ALTA HFA-877-2

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS		n/a	BASE METAL		n/a
CATALYST		n/a	ALLOYS		n/a
VEHICLE		n/a	METALLIC COATINGS		n/a
SOLVENTS		n/a	FILLER METAL PLUS COATING OR CORE FLUX		n/a
ADDITIVES		n/a	OTHERS		n/a
OTHERS		n/a			

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	approx. 200°F		SPECIFIC GRAVITY (H_2O=1)	1.25
VAPOR PRESSURE (mm Hg.)	approx. 18		PERCENT, VOLATILE BY VOLUME (%)	64%
VAPOR DENSITY (AIR=1)	approx. 1		EVAPORATION RATE (H2O =1) approx.	1
SOLUBILITY IN WATER	compl.			
APPEARANCE AND ODOR	clear to hazy, colorless solution; slight acetic odor			

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	FLAMMABLE LIMITS	Lel	Uel
none			
EXTINGUISHING MEDIA: n/a			
SPECIAL FIRE FIGHTING PROCEDURES: n/a			
UNUSUAL FIRE AND EXPLOSION HAZARDS: none			

(Continued on reverse side)

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE	n/a
EFFECTS OF OVEREXPOSURE	n/a
EMERGENCY AND FIRST AID PROCEDURES	Wash eyes with plenty of water if contacted;
	prescribe emetics to cause vomiting if ingested.

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	x	

INCOMPATABILITY *(Materials to avoid)*

HAZARDOUS DECOMPOSITION PRODUCTS

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	x	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Wash with plenty of water.

WASTE DISPOSAL METHOD

To normal sanitary sewer.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION *(Specify type)* none

VENTILATION	LOCAL EXHAUST good air circulaiton	SPECIAL
	MECHANICAL *(General)*	OTHER

PROTECTIVE GLOVES not required	EYE PROTECTION goggles recommended

OTHER PROTECTIVE EQUIPMENT none

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

normal cleanliness, avoid prolonged skin contact

OTHER PRECAUTIONS

Do not swallow.

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

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MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME: GENERAL PHOTO PRODUCTS Division of RHONE POULENC SYSTEMS CO.	EMERGENCY TELEPHONE NO.: (201) 297-0100
P.O. BOX 125, BLACK HORSE LANE, MONMOUTH JUNCTION, NJ 08852	
CHEMICAL NAME AND SYNONYMS: GPP LD-20/LD-41 PART A Generalith Developer	TRADE NAME AND SYNONYMS
CHEMICAL FAMILY: aqueous photo processing solution	FORMULA: SML-976A

SECTION II · HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS		n/a	BASE METAL		n/a
CATALYST		n/a	ALLOYS		n/a
VEHICLE		n/a	METALLIC COATINGS		n/a
SOLVENTS		n/a	FILLER METAL PLUS COATING OR CORE FLUX		n/a
ADDITIVES		n/a	OTHERS		n/a
OTHERS		n/a			

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)
n/a		

SECTION III · PHYSICAL DATA

BOILING POINT (°F.) approx.	212°F	SPECIFIC GRAVITY (H_2O=1)	1.23
VAPOR PRESSURE (mm Hg.) approx.	18	PERCENT, VOLATILE BY VOLUME (%)	60%
VAPOR DENSITY (AIR=1) approx.	1	EVAPORATION RATE (H_2O =1) approx.	1
SOLUBILITY IN WATER	complete		
APPEARANCE AND ODOR	clear, colorless to slight plum solution; odorless		

SECTION IV · FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used) none	FLAMMABLE LIMITS	Lel	Uel
EXTINGUISHING MEDIA: n/a			
SPECIAL FIRE FIGHTING PROCEDURES: n/a			
UNUSUAL FIRE AND EXPLOSION HAZARDS: none			

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: n/a

EFFECTS OF OVEREXPOSURE: n/a

EMERGENCY AND FIRST AID PROCEDURES: Wash skin and eyes if contacted.

Prescribe emetics to induce vomiting if ingested.

SECTION VI - REACTIVITY DATA

STABILITY			CONDITIONS TO AVOID
	UNSTABLE		
	STABLE	X	

INCOMPATABILITY (Materials to avoid): Avoid strong acids.

HAZARDOUS DECOMPOSITION PRODUCTS: sulfur dioxide

HAZARDOUS POLYMERIZATION			CONDITIONS TO AVOID
	MAY OCCUR		
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Wash with plenty of water.

WASTE DISPOSAL METHOD

To normal sanitary sewer.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type): none

VENTILATION		
	LOCAL EXHAUST: normal air circulation	SPECIAL
	MECHANICAL (General)	OTHER

PROTECTIVE GLOVES	EYE PROTECTION
not required	no special requirements

OTHER PROTECTIVE EQUIPMENT: none

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

normal cleanliness

OTHER PRECAUTIONS

Do not swallow.

GPO 934-190

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

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MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
GENERAL PHOTO PRODUCTS Division of RHONE-POULENC SYSTEMS	(201) 297-0100
P.O. BOX 125, BLACK HORSE LANE, MONMOUTH JUNCTION, NJ 08852	
CHEMICAL NAME AND SYNONYMS GPP LD-20/LD-42 PART B Generalith Developer	TRADE NAME AND SYNONYMS
CHEMICAL FAMILY aqueous photo processing solution	FORMULA SML-976B

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS		n/a	BASE METAL		n/a
CATALYST		n/a	ALLOYS		n/a
VEHICLE		n/a	METALLIC COATINGS		n/a
SOLVENTS		n/a	FILLER METAL PLUS COATING OR CORE FLUX		n/a
ADDITIVES		n/a	OTHERS		n/a
OTHERS		n/a			

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)
n/a		

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	approx.	200°F	SPECIFIC GRAVITY (H_2O=1)	1.32
VAPOR PRESSURE (mm Hg.)	approx.	18	PERCENT, VOLATILE BY VOLUME (%)	54%
VAPOR DENSITY (AIR=1)	approx.	1	EVAPORATION RATE (H_2O =1)	1
SOLUBILITY IN WATER		total		
APPEARANCE AND ODOR	clear, colorless to slight tan solution; odorless			

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	FLAMMABLE LIMITS	Lel	Uel
none			

EXTINGUISHING MEDIA
n/a

SPECIAL FIRE FIGHTING PROCEDURES
n/a

UNUSUAL FIRE AND EXPLOSION HAZARDS
none

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE

n/a

ECTS OF OVEREXPOSURE

n/a

EMERGENCY AND FIRST AID PROCEDURES

Wash skin and eyes if contacted; prescribe emetics to induce vomiting if ingested.

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	

INCOMPATABILITY *(Materials to avoid)*

Avoid strong acids.

HAZARDOUS DECOMPOSITION PRODUCTS

sulfur dioxide

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Wash with plenty of water.

WASTE DISPOSAL METHOD

To normal sanitary sewer.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION *(Specify type)*

none

VENTILATION	LOCAL EXHAUST: normal	SPECIAL
	MECHANICAL *(General)*	OTHER

PROTECTIVE GLOVES: not required	EYE PROTECTION: goggles recommended

OTHER PROTECTIVE EQUIPMENT

none

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Avoid undue skin contact; employ normal cleanliness.

OTHER PRECAUTIONS

DO not swallow.

GPO 934-190

7/6/92

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

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MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
ALTA CHEMICAL CORPORATION	(619) 453-5010

ADDRESS (Number, Street, City, State, and ZIP Code): 11526-F Sorrento Valley Road, San Diego, CA 92121

CHEMICAL NAME AND SYNONYMS	TRADE NAME AND SYNONYMS
NGS R-30 Replenisher Part A	

CHEMICAL FAMILY	FORMULA
AQUEOUS PHOTO PROCESSING SOLUITON	ALTA LPDR-1075

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS		n/a	BASE METAL		n/a
CATALYST		n/a	ALLOYS		n/a
VEHICLE		n/a	METALLIC COATINGS		n/a
SOLVENTS		n/a	FILLER METAL PLUS COATING OR CORE FLUX		n/a
ADDITIVES		n/a	OTHERS		n/a
OTHERS		n/a			

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)

THIS SHEET PROVIDED FOR INFORMATION ONLY NOT REQUIRED

SECTION III - PHYSICAL DATA

BOILING POINT (°F.) approx.	212°F	SPECIFIC GRAVITY (H_2O=1)	1.21
VAPOR PRESSURE (mm Hg.) approx.	18	PERCENT, VOLATILE BY VOLUME (%)	68%
VAPOR DENSITY (AIR=1) approx.	1	EVAPORATION RATE (H_2O = 1) approx.	1
SOLUBILITY IN WATER	compl.		
APPEARANCE AND ODOR	Clear, colorless solution; odorless.		

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	FLAMMABLE LIMITS	Lel	Uel
none			

EXTINGUISHING MEDIA: n/a

SPECIAL FIRE FIGHTING PROCEDURES: n/a

UNUSUAL FIRE AND EXPLOSION HAZARDS: none

(Continued on reverse side)

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: n/a

EFFECTS OF OVEREXPOSURE: n/a

EMERGENCY AND FIRST AID PROCEDURES

Wash skin and eyes if contacted.

Prescribe emetics to cause vomiting if ingested.

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	x	

INCOMPATABILITY *(Materials to avoid)*: Avoid strong acids.

HAZARDOUS DECOMPOSITION PRODUCTS: Sulfur dioxide

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	x	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Wash with plenty of water

WASTE DISPOSAL METHOD: To normal sanitary sewer.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION *(Specify type)*: none

VENTILATION	LOCAL EXHAUST: Normal air circulation	SPECIAL
	MECHANICAL *(General)*	OTHER

PROTECTIVE GLOVES: not required	EYE PROTECTION: no special requirements

OTHER PROTECTIVE EQUIPMENT

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Normal cleanliness

OTHER PRECAUTIONS: Do not swallow

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44-R1387

MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
ALTA CHEMICAL CORPORATION	(619) 453-5010

ADDRESS (*Number, Street, City, State, and ZIP Code*): 11526-F Sorrento Valley Road, San Diego, CA 92121

CHEMICAL NAME AND SYNONYMS	TRADE NAME AND SYNONYMS
NGS R-30 Replenisher Part B	

CHEMICAL FAMILY	FORMULA
AQUEOUS PHOTO PROCESSING SOLUTION	ALTA LPDR-1075

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS		n/a	BASE METAL		n/a
CATALYST		n/a	ALLOYS		n/a
VEHICLE		n/a	METALLIC COATINGS		n/a
SOLVENTS		n/a	FILLER METAL PLUS COATING OR CORE FLUX		n/a
ADDITIVES		n/a	OTHERS		n/a
OTHERS		n/a			

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)

THIS SHEET PROVIDED FOR INFORMATION ONLY NOT REQUIRED BY LAW

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	approx.	200°F	SPECIFIC GRAVITY (H_2O=1)	1.32
VAPOR PRESSURE (mm Hg.)	approx.	18	PERCENT, VOLATILE BY VOLUME (%)	54%
VAPOR DENSITY (AIR=1)	approx.	1	EVAPORATION RATE (H_2O =1)	approx. 1
SOLUBILITY IN WATER		compl.		
APPEARANCE AND ODOR	Clear, colorless to slight tan solution; odorless.			

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	FLAMMABLE LIMITS	Lel	Uel
none			

EXTINGUISHING MEDIA: n/a

SPECIAL FIRE FIGHTING PROCEDURES: n/a

UNUSUAL FIRE AND EXPLOSION HAZARDS: none

(Continued on reverse side)

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: n/a

EFFECTS OF OVEREXPOSURE: n/a

EMERGENCY AND FIRST AID PROCEDURES: Wash skin and eyes if contacted; prescribe emetics to induce vomiting if ingested.

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	x	

INCOMPATABILITY *(Materials to avoid)*: Avoid strong acids

HAZARDOUS DECOMPOSITION PRODUCTS: Sulfur dioxide

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	x	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Wash with plenty of water.

WASTE DISPOSAL METHOD: To normal sanitary sewer.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION *(Specify type)*: none

VENTILATION	LOCAL EXHAUST: Normal air circulation	SPECIAL
	MECHANICAL *(General)*	OTHER

PROTECTIVE GLOVES: optional

EYE PROTECTION: goggles recommended

OTHER PROTECTIVE EQUIPMENT: none

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Avoid undue skin contact; employ normal cleanliness.

OTHER PRECAUTIONS

Do not swallow.

Form OSHA-20
Rev. May 72

MAY 16 1989

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44-R1387

REV. 6/1/85

MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
N.D.I.	(312) 685-0040
ADDRESS (Number, Street, City, State, and ZIP Code) 4985 N. Elston Ave Chicago, Ill. 60630	
CHEMICAL NAME AND SYNONYMS	TRADE NAME AND SYNONYMS Neutrofount
CHEMICAL FAMILY Neutral Aqueous Solution	FORMULA

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)
No CAS #'s for this material Neutrofount.		

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	212+	SPECIFIC GRAVITY (H_2O=1)	1.08
VAPOR PRESSURE (mm Hg.) @68°F.	17	PERCENT, VOLATILE BY VOLUME (%)	75
VAPOR DENSITY (AIR=1)	0.625	EVAPORATION RATE (water = 1)	less than 1
SOLUBILITY IN WATER	Complete		
APPEARANCE AND ODOR	A green liquid with a faint sweet smell.		

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	FLAMMABLE LIMITS	LEL	UEL
None(Any) non-combustible			

EXTINGUISHING MEDIA

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

(Continued on reverse side)

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE
Water is the sole volatile component

EFFECTS OF OVEREXPOSURE
Skin - Defatting action Eyes- irritant

EMERGENCY AND FIRST AID PROCEDURES
Skin and eyes: flush with water.

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	

INCOMPATABILITY (Materials to avoid)

HAZARDOUS DECOMPOSITION PRODUCTS

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Flush or mopp with water.

WASTE DISPOSAL METHOD
Sanitary Sewers

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type)

VENTILATION	LOCAL EXHAUST	SPECIAL
	MECHANICAL (General)	OTHER

PROTECTIVE GLOVES	EYE PROTECTION

OTHER PROTECTIVE EQUIPMENT

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Store drums in upright position to prevent leaking. While no health hazzard is known, it is wise to treat this material with respect and avoid unecessary contact.

OTHER PRECAUTIONS

GPO 934-190

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44-R1387

MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

Revised 1 Nov. 1985

MANUFACTURER'S NAME: VARN PRODUCTS COMPANY, INC.	EMERGENCY TELEPHONE NO.: (201) 337-3600
ADDRESS: 175 Route 208, Oakland, N.J. 07436	
CHEMICAL NAMES AND SYNONYMS: Not Applicable	TRADE NAME AND SYNONYMS: 100% GUM ARABIC SO. 14°Be.
CHEMICAL FAMILY: Not Applicable	FORMULA

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENTS	% RANGE	TLV (UNITS)	INGREDIENTS	% RANGE	TLV (UNITS)
No Hazardous Materials					

SECTION III - PHYSICAL DATA

BOILING POINT (°F.) Initial	214	SPECIFIC GRAVITY (H20=1)	1.11
VAPOR PRESSURE (mm Hg)	133	PERCENT VOLATILE BY VOLUME (%)	60
VAPOR DENSITY (AIR=1)	0.60	EVAPORATION RATE (water)	1
SOLUBILITY IN WATER	100		
APPEARANCE AND ODOR	Brown Liquid - Slightly Acrid Odor		

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method Used)	Not Applicable
EXTINGUISHING MEDIA	If solution is dried out - any extinguishing media
SPECIAL FIREFIGHTING PROCEDURES	
UNUSUAL FIRE EXPLOSION HAZARDS	

(CONTINUED ON REVERSE SIDE)

TRADE NAME 100% GUM ARABIC SOL. 14° Be.

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE	NA
EFFECTS OF OVEREXPOSURE	Eye - mild irritation
EMERGENCY AND FIRST AID PROCEDURES	Wash with large volumes of water. If irritation persists, see physician.

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	
INCOMPATIBILITY (Materials to Avoid)	Strong, oxidizing materials		
HAZARDOUS DECOMPOSITION PRODUCTS	CO_2, CO on ignition		
HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED	Mop up and wah area with soap and water.
WASTE DISPOSAL METHOD	Sewer - subject to local sewer regulations.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify Type) NA		
VENTILATION	LOCAL EXHAUST NA	SPECIAL
	MECHANICAL (General) NA	OTHER
PROTECTIVE GLOVES NA		EYE PROTECTION goggles
OTHER PROTECTIVE EQUIPMENT		

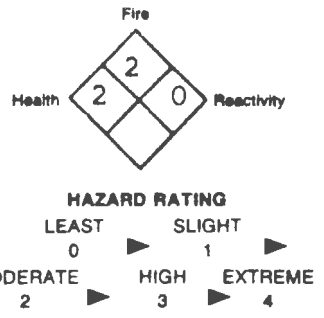
SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING	Keep from freezing or excessive heat
OTHER PRECAUTIONS	

ANCHOR/LITHKEMKO

50 INDUSTRIAL LOOP NORTH ORANGE PARK FL 32073

MATERIAL SAFETY DATA SHEET



This MSDS complies with 29 CFR 1910:1200 (Hazard Communications)

PRODUCT NAME: NGS PLATE SENSITIZER 4010 Coating and Super 4010 Coating 4010, 4010S	DATE: 10-5-85
MANUFACTURER'S NAME ANCHOR/LITHKEMKO	
STREET ADDRESS 50 Industrial Loop North / P.O. Box 979	
CITY, STATE, AND ZIP CODE Orange Park, Florida 32073	

EMERGENCY PHONE NUMBER • 904-264-3500 • This number is available days, nights, weekends and holidays.

PRODUCT: 4010, 4010S CHEMICAL NAME: NA CAS NUMBER: Not Applicable for Blends DOT PROPER SHIPPING NAME: Combustible Liquid UN Number: 1142 VOC: 10% - Rule 1130 Non-photochemically reactive - Rule 102	WARNING STATEMENT: Combustible Mixture Toxic Avoid prolonged or repeated vapor breathing. Avoid prolonged or repeated skin or eye contact. If swallowed, induce vomiting; seek medical attention immedieately. Use in well ventilated area FOR INDUSTRIAL USE ONLY

Section I - INGREDIENTS

MATERIAL	TLV*	SOURCE
1. Methyl Alcohol CAS# 67-56-1 syn: methanol	200ppm(skin) 200ppm(skin)	OSHA ACGIH

TLV - Threshold Limit Value **NE - Not Established** **NA - Not Applicable**

Federal Law Requires persons receiving this Material Data Sheet to study it carefully, become aware of hazards, if any, of the product involved. In the interest of safety you should (1) notify your employees, agents, and contractors of the information on this sheet, (2) furnish a copy to each of your customers for the product, and (3) request your customers to inform their employees and customers as well.

Section II - EMERGENCY AND FIRST AID PROCEDURES

Eye Contact	If this product comes in contact with eyes, gently flush with large quantities of water for at least 15 minutes and seek immediate medical attention.
Skin Contact	If this product comes in contact with the skin, remove contaminated clothing and wash with quantities of water and seek medical attention if irritation from contact persists. Absorbed through skin.
Inhalation	If breathing difficulties, dizziness, or light-headedness occur when working in areas with high vapor concentration, victim should seek air free of vapors. If victim experiences continued breathing difficulties, oxygen, where available, should be administered by qualified personnel until medical assistance can be rendered. If breathing stops, begin artificial respiration and seek immediate attention.
Ingestion	Do NOT give liquids if victim is unconscious or very drowsy. Otherwise, give more than 2 glasses of water and induce vomiting by giving 30cc (2TBL) Syrup of Ipecac. If Ipecac is unavailable, give 2 glasses of water and induce vomiting by touching finger to back of victim's throat. Keep victim's head below hips while vomiting. Seek medical attention immediately.

Section III - PHYSIOLOGICAL EFFECTS AND HEALTH INFORMATION

Eye	This product may be an eye irritant.
Skin Effects	Prolonged or repeated skin contact may result in dermatitis.
Systemic Effects	Various studies have shown a possible association with exposure to this product and the following: Liver abnormalities, kidney, eye, lung, spleen, brain, and nervous system damage.

Section IV - SPECIAL PROTECTION INFORMATION

Respiratory Protection (Specify Type)	The use of respiratory protection depends on vapor concentration above the time-weighted TLV. Use a respirator/gas mark with appropiate cartridges and canister (NIOSH approved, if available), or supplied air equipment, depending on airborne concentration.		
Ventilation	General mechanical ventilation may be sufficient to keep product vapor concentrations within specified time-weighted TLV ranges. If general ventilation proves inadequate to maintain safe vapor concentrations, supplemental local exhaust may be required. Other special precautions, such as respiratory protection, may be required if vapor concentrations cannot be reduced to below the TLV by ventilation.		
Protective Gloves	The use of gloves which are impermeable to the specific material handled is advised to prevent skin irritation and absorption.	Eye Protection	Safety glasses, chemical goggles and/or face shields are recommended to safeguard against potential eye contact, irritation or injury.
Other Protective Equipment	Impermeable aprons are advised when working with this product. The availability of eye washes and safety showers in work areas is recommended.		

Section V - REACTIVITY DATA

Stability	Unstable	Conditions to Avoid: NA
	X Stable	
Incompatibility Materials to Avoid	Strong oxidizers	
Hazardous Decomposition Products	Thermal decomposition in the presence of air may yield carbon monoxide and/or carbon dioxide.	
Hazardous Polymerization	May Occur	Conditions to Avoid: NA
	X Will Not Occur	

Section VI - SPILL OR LEAK PROCEDURES

Precautions In Case of Release or Spill	Stay upwind and away from spill unless wearing appropriate protective equipment (See Section IV). Stop and/or contain discharge if it may be done safely. Keep all sources of ignition away. Ventilate area of spill. Use non-sparking tools for cleanup. Cover with inert material to reduce fumes. Keep out of drains, sewers or waterways. Contact fire authorities. Notify local health and pollution control agencies. Call spill response teams if large spill.
Waste Disposal Method	Dispose of product in accordance with applicable local, county, state and federal regulations.

Section VII - STORAGE AND SPECIAL PRECAUTIONS

Handling & Storing Precautions	Keep product containers cool, dry, and away from sources of ignition. Use and store this product with adequate ventilation. (See Section IV) Keep product containers closed when not in use.
Other Precautions	Personnel should avoid inhalation of vapors. (See Sections I,II,III,V,VI) Personal contact with the product should be avoided. Should contact be made, remove saturated clothing and flush affected areas with water. (See Sections II,IV,VI) Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in this data sheet must be observed.

Section VIII - FIRE AND EXPLOSION HAZARD DATA

DOT Flammability Classification	Combustible Liquid	Flash Point TCC 124 F
Extinguishing Media	Use foam, CO_2 or dry chemical fire fighting apparatus.	
Unusual Fire & Explosion Hazards	Keep work areas free of hot metal surfaces and other sources of ignition. Blends containing chlorinated products may exhibit reduced flash point as the more volatile chlorinate evaporates.	
Fire Fighting Procedures	The use of self-contained breathing apparatus is recommended for fire fighters. Water may be unsuitable as an extinguishing media, but helpful in keeping adjacent containers cool. Avoid spreading burning liquid with water used for cooling purposes.	

Section IX - PHYSICAL DATA

Approximate Boiling Range, °F	150 - 215	Vapor Density: ☐ Heavier Than Air ☐ Lighter Than Air NE	
Evaporation Rate: ☐ Faster ☐ Slower NE		Percent Volatile: 100%	Solubility in Water: 80%
Specific Gravity: ☒ Lighter Than Water ☐ Heavier Than Water		8.2 Weight (lbs.) Per Gallon	Appearance & Odor: Clear, colorless liquid Faint alcohol odor

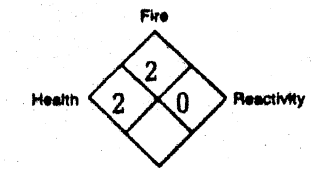
Section X - DOCUMENTARY INFORMATION

Product Code No.	4010, 4010S	Issue Date	10-5-85	Prepared By	VM
Replaces:		Product Code No.		Issued	
Reviewed By:	JAS				

The options expressed herein are those of qualified experts within ANCHOR/LITHKEMKO and its suppliers. We believe that the information contained herein is current as of the date of this material Safety Data Sheet. Since the use of this information and these opinions and the conditions of use of the product are not within the control of ANCHOR/LITHKEMKO, it is the user's obligation to determine the conditions of safe use of the product.

ANCHOR/LITHKEMKO
50 INDUSTRIAL LOOP NORTH ORANGE PARK FL 32073

MATERIAL SAFETY DATA SHEET



HAZARD RATING
LEAST 0 ► SLIGHT 1 ►
MODERATE 2 ► HIGH 3 ► EXTREME 4

This MSDS complies with 29 CFR 1910:1200 (Hazard Communication)

PRODUCT NAME:	DATE:
Black Bristle/#7 Plate Developer 4047	9-24-85
MANUFACTURER'S NAME: ANCHOR/LITHKEMKO	
STREET ADDRESS: 50 Industrial Loop / P. O. Box 979	
CITY, STATE, AND ZIP CODE: Orange Park, Florida 32073	

EMERGENCY PHONE NUMBER • 904-264-3500 • This number is available days, nights, weekends and holidays.

PRODUCT: 4047 CHEMICAL NAME: NA CAS NUMBER: Not Applicable for Blends DOT PROPER SHIPPING NAME: Combustible Liquid UN Number: 1142 V.O.C.: 16% -rule 102 Non Photochemically Reactive	WARNING STATEMENT: Combustible Liquid Avoid Skin Contact Avoid inhalation of vapors If swallowed, do NOT induce vomiting Seek medical attention immediately Use in well ventilated area Toxic FOR INDUSTRIAL USE ONLY

Section I - INGREDIENTS

MATERIAL	TLV*	SOURCE
1. Acetic Acid CAS#64-19-7	10ppm	ACGIH
2. Butyl Cellosolve CAS#1110-76-2 syn: 2-Butoxyethanol	50ppm 25ppm	OSHA ACGIH
3. Cyclohexanone CAS#108-94-1	50ppm 25ppm	OSHA ACGIH

TLV - Threshold Limit Value **NE - Not Established** **NA - Not Applicable**

Federal Law Requires persons receiving this Material Data Sheet to study it carefully ware of hazards, if any, of the product involved. In the interest of safety you should (1) notify your employees, agents, and contractors of the information on th rnish a copy to each of your customers for the product, and (3) request your customers to inform their employees and customers as w

Section II - EMERGENCY AND FIRST AID PROCEDURES

Eye Contact	If this product comes in contact with eyes, gently flush with large quantities of water for at least 15 minutes and seek immediate medical attention.
Skin Contact	If this product comes in contact with the skin, remove contaminated clothing and wash with quantities of water and seek medical attention if irritation from contact persists. May be absorbed through skin.
Inhalation	If breathing difficulties, dizziness, or light-headedness occur when working in areas with high vapor concentration, victim should seek air free of vapors. If victim experiences continued breathing difficulties, oxygen, where available, should be administered by qualified personnel until medical assistance can be rendered. If breathing stops, begin artificial respiration and seek immediate attention.
Ingestion	Do NOT induce vomiting. Seek medical attention immediately.

Section III - PHYSIOLOGICAL EFFECTS AND HEALTH INFORMATION

Eye	This product may be an eye irritant.
Skin Effects	Prolonged or repeated skin contact may result in dermatitis. May be absorbed through skin.
Systemic Effects	Various studies have shown a possible association with exposure to this product and the following: Excessive overexposure may cause blood, lung, liver and kidney damage. May cause material toxicity in laboratory animals.

Section IV - SPECIAL PROTECTION INFORMATION

Respiratory Protection (Specify Type)	The use of respiratory protection depends on vapor concentration above the time-weighted TLV. Use a respirator/gas mark with appropiate cartridges and canister (NIOSH approved, if available), or supplied air equipment, depending on airborne concentration.		
Ventilation	General mechanical ventilation may be sufficient to keep product vapor concentrations within specified time-weighted TLV ranges. If general ventilation proves inadequate to maintain safe vapor concentrations, supplemental local exhaust may be required. Other special precautions, such as respiratory protection, may be required if vapor concentrations cannot be reduced to below the TLV by ventilation.		
Protective Gloves	The use of gloves which are impermeable to the specific material handled is advised to prevent skin irritation and absorption.	Eye Protection	Safety glasses, chemical goggles and/or face shields are recommended to safeguard against potential eye contact, irritation or injury.
Other Protective Equipment	Impermeable aprons are advised when working with this product. The availability of eye washes and safety showers in work areas is recommended.		

Section V - REACTIVITY DATA

Stability	Unstable	Conditions to Avoid: Excessive heat
	X Stable	
Incompatibility Materials to Avoid	Strong oxidizing agents.	
Hazardous Decomposition Products	Thermal decomposition in the presence of air may yield carbon monoxide and/or carbon dioxide.	
Hazardous Polymerization	May Occur	Conditions to Avoid: NA
	X Will Not Occur	

Section VI - SPILL OR LEAK PROCEDURES

Precautions In Case of Release or Spill	Stay upwind and away from spill unless wearing appropriate protective equipment (See Section IV). Stop and/or contain discharge if it may be done safely. Keep all sources of ignition away. Ventilate area of spill. Use non-sparking tools for cleanup. Cover with inert material to reduce fumes. Keep out of drains, sewers or waterways. Contact fire authorities. Notify local health and pollution control agencies. Call spill response teams if large spill.
Waste Disposal Method	Dispose of product in accordance with applicable local, county, state and federal regulations.

Section VII - STORAGE AND SPECIAL PRECAUTIONS

Handling & Storing Precautions	Keep product containers cool, dry, and away from sources of ignition. Use and store this product with adequate ventilation. (See Section IV) Keep product containers closed when not in use.
Other Precautions	Personnel should avoid inhalation of vapors. (See Sections I,II,III,V,VI) Personal contact with the product should be avoided. Should contact be made, remove saturated clothing and flush affected areas with water. (See Sections II,IV,VI) Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in this data sheet must be observed.

Section VIII - FIRE AND EXPLOSION HAZARD DATA

DOT Flammability Classification	Combustible Liquid	Flash Point TCC 138 F
Extinguishing Media	Use foam, CO_2 or dry chemical fire fighting apparatus.	
Unusual Fire & Explosion Hazards	Keep work areas free of hot metal surfaces and other sources of ignition. Blends containing chlorinated products may exhibit reduced flash point as the more volatile chlorinate evaporates.	
Fire Fighting Procedures	The use of self-contained breathing apparatus is recommended for fire fighters. Water may be unsuitable as an extinguishing media, but helpful in keeping adjacent containers cool. Avoid spreading burning liquid with water used for cooling purposes.	

Section IX - PHYSICAL DATA

Approximate Boiling Range, °F	NE	Vapor Density: ☐ Heavier Than Air ☐ Lighter Than Air	NE
Evaporation Rate: ☐ Faster ☐ Slower	NE	Percent Volatile: 87%	Solubility in Water: 50%
Specific Gravity: ☐ Lighter Than Water ☒ Heavier Than Water		10.1 Weight (lbs.) Per Gallon	Appearance & Odor: Black opaque liquid Sweet Odor

Section X - DOCUMENTARY INFORMATION

Product Code No.	4047	Issue Date	9-24-85	Prepared By	VM
Replaces:		Product Code No.		Issued	
Reviewed By:	JAS				

The options expressed herein are those of qualified experts within ANCHOR/LITHKEMKO and its suppliers. We believe that the information contained herein is current as of the date of this material Safety Data Sheet. Since the use of this information and these opinions and the conditions of use of the product are not within the control of ANCHOR/LITHKEMKO, it is the user's obligation to determine the conditions of safe use of the product.

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44-R1387

MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
HURST GRAPHICS, Inc.	(213) 223-4121

ADDRESS (Number, Street, City, State, and ZIP Code)
2500 San Fernando Rd., Los Angeles, CA 90065

CHEMICAL NAME AND SYNONYMS	TRADE NAME AND SYNONYMS
HURST No. 2032	Newspaper Blanket & Roller Wash
CHEMICAL FAMILY: Oxygenated Hydrocarbon-Solvent Blend	FORMULA: N/A

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS Acetone	40	750	FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES Aromatic Hydrocarbon	60	100	OTHERS		
OTHERS					

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)
None		

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	132°F	SPECIFIC GRAVITY (H_2O=1)	0-830
VAPOR PRESSURE (mm Hg.)	<760	PERCENT, VOLATILE BY VOLUME (%)	100%
VAPOR DENSITY (AIR=1)	N/A	EVAPORATION RATE (But. Act. =1)	3.0
SOLUBILITY IN WATER	40%		
APPEARANCE AND ODOR	Characteristic odor of acetone.		

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	FLAMMABLE LIMITS	Lel	Uel
<30°F. TCC			

EXTINGUISHING MEDIA: Foam

SPECIAL FIRE FIGHTING PROCEDURES: Use foam - Avoid water

UNUSUAL FIRE AND EXPLOSION HAZARDS: HIGHLY FLAMMABLE

Keep work area free of other sources of ignition.

(Continued on reverse side)

NOTICE: HURST GRAPHICS furnishes Material Safety Data Sheets based on information from it's raw material suppliers. HURST GRAPHICS does not guarantee the accuracy of the data therein, nor assume liability of any kind in releasing Material Safety Data Sheets. Caution is advised with regard to Threshold Limit Value (TLV), because these values are constantly being revised (both higher and lower).

HURST No. 2032

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE	See Section II
EFFECTS OF OVEREXPOSURE	Prolonged or repeated skin contact may cause dermatitis. Eye irritant, nausea and vomiting, possible blindness if neglected. Absorption through skin.
EMERGENCY AND FIRST AID PROCEDURES	If eye contact flush with water immediately for 15 minutes and call a physician if complications - If breathing difficulties due to prolonged inhalation: Relocate to fresh air - seek medical attention if required. Ingestion: Induce vomiting - seek medical attention if required.

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	

INCOMPATABILITY *(Materials to avoid)*

HAZARDOUS DECOMPOSITION PRODUCTS: Petroleum solvents.

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Shut-off all flame sources. Flush with water.

WASTE DISPOSAL METHOD: 1 - Follow applicable methods. 2 - Prevent from entering drains and natural water ways.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION *(Specify type)*: Wear face masks

VENTILATION	LOCAL EXHAUST	SPECIAL
	MECHANICAL *(General)*	OTHER

PROTECTIVE GLOVES	Wear gloves	EYE PROTECTION	Face shields - Eye goggles

OTHER PROTECTIVE EQUIPMENT: Impermeable apron advised.

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Keep containers cool and far from flames. Use and store with adequate ventilation - Keep container always CLOSED.

OTHER PRECAUTIONS: Avoid inhalation of vapor - Avoid flames nearby - Prevent smoking in work areas absolutely.

MATERIAL SAFETY DATA SHEET

For chemicals, coatings and related materials

'Essentially similar' to form OSHA-20

DATE PREPARED:
1- 9-86

Manufacturer

NAME : United States Printing Ink
ADDRESS: 943 Murray Hill Parkway
ADDRESS: East Rutherford, NJ
ADDRESS:
ZIPCODE: 07073

EMERGENCY PHONE NUMBER
DAY: (201) 933-7100
NIGHT: (201) 933-7100

INFORMATION PHONE NUMBER
(201) 933-7100

Section I - Product

NUMBER: SL-3105
NAME : LO RUB BLACK
CLASS : WEB OFFSET

H M I S Hazard Codes
Health: 1 Slight
Flammability: 1 Slight
Reactivity: 0 Minimal
Personal Protective Equipment: None

Section II - Hazardous Ingredients

Ingredient Material Description	Percent by weight	C. A. S. Registry No.	LEL	Vapor Pressure mm Hg @ 20 C
TREATED NAPTHENIC DISTILLATES	00.00		N/A	00.01

Section III - Physical Data

Boiling Range: 500. - N/A deg F
Freezing Point: N/A deg F
Vapor Pressure: N/A mm @ 20 deg C
Vapor Density: Lighter than air
Specific Gravity: 01.00
H2O Soluble: Negligible (< 0.1%)
Evaporation Rate: Slower
(relative to n-butyl acetate)
% Volatile by Volume: N/A %

Appearance and Odor: BLACK PASTE, MILD

Section IV - Fire and Explosion Hazard Data

Flash point: 230.0 deg F
(Method Used) Pensky-Martens

Explosive Limits: LEL N/A UEL (%V in air) N/A

FLAMMABILITY CLASSIFICATION
OSHA: Combustible Liquid - Class IIIB
DOT : Not regulated

EXTINGUISHING MEDIA:
foam,dry chemical,water foam

SPECIAL FIRE FIGHTING PROCEDURES:
no special fire fighting equipment necessary
Use self-contained breathing equipment in enclosed areas

UNUSUAL FIRE AND EXPLOSION HAZARDS:
N/A

Section V - Toxicological Information

Ingredient Material Description	PEL	TLV (twa) mg/m3	TLV (twa) ppm	LD50(mg/kg) (rat) ORAL	LD50(mg/kg) (rbt) DERMAL	LC50(ppm) (rat) INHAL
TREATED NAPTHENIC DISTILLATES	N/A	05.00	N/A	N/A	N/A	N/A

Section VI - Health Hazard Data

E CTS OF OVEREXPOSURE: THRESHOLD LIMIT VALUES: See Section V
Eye contact may cause burning and irritation. Irritation or dermatitis may develop on prolonged or repeated skin exposure. Excessive inhalation in a mist form may cause local irritation, dizziness, drowsiness. Ingestion may cause local irritation of the muscous membranes of the mouth, esophagus, and stomach. May act as a laxative.
EMERGENCY AND FIRST AID PROCEDURES:
EYE CONTACT: Flush eyes with large amounts of water. Continue at least for 15 minutes. SKIN CONTACT: Remove all contaminated clothing. Wash exposed portions of the skin with soap and water.
INHALATION: Remove exposed person to fresh air immediately.
INGESTION: if material has been swallowed, SEEK MEDICAL ATTENTION.

Section VII - Reactivity Data

STABILITY: Stable
STABILITY CONDITIONS TO AVOID:
STABLE
INCOMPATABILITY (MATERIALS TO AVOID CONTACT WITH):
Avoid contact with strong oxidants such as Chlorine.
HAZARDOUS DECOMPOSITION PRODUCTS:
Dense smoke may be generated when burning, along with carbon dioxide and carbon monoxide.
HAZARDOUS POLYMERIZATION: Will not occur
PO YMERIZATION CONDITIONS TO AVOID:
W l not occur

Section VIII - Spill or Leak Procedures

STEPS FOR MATERIAL SPILLAGE:
Collect large spills with shovel, dry sand and/or absorbant material. Clean spill area with detergent solutions. Provide adequate ventilation during clean-up.
WASTE DISPOSAL METHODS:
Dispose in accordance with local, state and federal regulations.

Section IX - Special Protection Information

RESPIRATORY PROTECTION:
Not required under normal usage. If product handling creates a vapor or mist, then use half-mask or full piece respirator with replaceable cartridge filter.
VENTILATION:
Adequate ventilation in accordance with good engineering practice must be provided to keep any oil mist below the PEL.
PROTECTIVE GLOVES:
Gloves should be made available to avoid prolonged or repeated skin contact.
EYE PROTECTION:
Suitable eye protection equipment should be made available when w ing presses to avoid splashing into eyes.
OTHER PROTECTIVE EQUIPMENT:
General good hygiene practices should be enforced. Hands and face should be washed with soap and water before smoking or eating.

Section X - Special Precautions

HANDLING AND STORAGE PRECAUTIONS:
Containers should be closed when not in use and stored away from heat, open flame, and oxidizing materials.
OTHER PRECAUTIONS:
Do not wear contaminated clothing. Launder before reuse. Wash skin thoroughly with soap and water and/or waterless skin cleanser after handling.

Authorized Signature: Richard C. Hallock

Date: 1/9/96

Title: Environmental Coordinator

MATERIAL SAFETY DATA SHEET

For chemicals, coatings and related materials

'Essentially similar' to form OSHA-20

D : PREPARED:
1-10-86

Manufacturer

NAME : United States Printing Ink
ADDRESS: 349 Murray Hill Parkway
ADDRESS: East Rutherford, NJ
ADDRESS:
ZIPCODE: 07073

EMERGENCY PHONE NUMBER
DAY: (201) 933-7100
NIGHT: (201) 933-7100

INFORMATION PHONE NUMBER
(201) 933-7100

Section I - Product

NUMBER: PR-1565
NAME : E.O. RED
CLASS : WEB OFFSET

H M I S Hazard Codes
Health: 1 Slight
Flammability: 1 Slight
Reactivity: 0 Minimal
Personal Protective Equipment: None

Section II - Hazardous Ingredients

Ingredient / Material Description	Percent (by weight)	C. A. S. Registry No.	LEL	Vapor Pressure mm Hg @ 20 C
TREATED NAPHTHENIC DISTILLATE	00.00		N/A	00.01
TREATED NAPTHENIC DISTILLATES	00.00		N/A	00.01

Section III - Physical Data

Boiling Range: 500. - N/A deg F
Freezing Point: N/A deg F
Vapor Pressure: N/A mm @ 20 deg C
Vapor Density: Lighter than air
Specific Gravity: 01.00
H20 Soluble: Negligible (< 0.1%)
Evaporation Rate: Slower
(re ative to n-butyl acetate)
% Volatile by Volume: N/A %

Appearance and Odor: RED PASTE, MILD

Section IV - Fire and Explosion Hazard Data

Flash point: 230.0 deg F
(Method Used) Pensky-Martens

Explosive Limits: LEL N/A UEL (%V in air) N/A

FLAMMABILITY CLASSIFICATION
OSHA: Combustible Liquid - Class IIIB
DOT : Not regulated

EXTINGUISHING MEDIA:
foam,dry chemical,water foam

SPECIAL FIRE FIGHTING PROCEDURES:
no special fire fighting equipment necessary.
Use self-contained breathing equipment in enclosed areas

UNUSUAL FIRE AND EXPLOSION HAZARDS:
N/A

Section V - Toxicological Information

Ingredient / Material Description	PEL	TLV (twa) mg/m3	TLV (twa) ppm	LD50(mg/kg) (rat) ORAL	LD50(mg/kg) (rbt) DERMAL	LC50(ppm) (rat) INHAL
TREATED NAPHTHENIC DISTILLATE	N/A	N/A	N/A	N/A	N/A	N/A
TREATED NAPTHENIC DISTILLATES	N/A	05.00	N/A	N/A	N/A	N/A

Section VI - Health Hazard Data

EFFECTS OF OVEREXPOSURE: THRESHOLD LIMIT VALUES: See Section V
Eye contact may cause burning and irritation. Irritation or dermatitis may develop on prolonged or repeated skin exposure. Excessive inhalation in a mist form may cause local irritation, dizziness, drowsiness. Ingestion may cause local irritation of the muscous membranes of the mouth, esophagus, and stomach. May act as a laxative.
EMERGENCY AND FIRST AID PROCEDURES:
EYE CONTACT: Flush eyes with large amounts of water. Continue at least for 15 minutes. SKIN CONTACT: Remove all contaminated clothing. Wash exposed portions of the skin with soap and water.
INHALATION: Remove exposed person to fresh air immediately.
INGESTION: if material has been swallowed, SEEK MEDICAL ATTENTION.

Section VII - Reactivity Data

STABILITY: Stable
STABILITY CONDITIONS TO AVOID:
STABLE
INCOMPATABILITY (MATERIALS TO AVOID CONTACT WITH):
Avoid contact with strong oxidants such as Chlorine.
HAZARDOUS DECOMPOSITION PRODUCTS:
Dense smoke may be generated when burning, along with carbon dioxide and carbon monoxide.
HAZARDOUS POLYMERIZATION: Will not occur
POLYMERIZATION CONDITIONS TO AVOID:
Will not occur

Section VIII - Spill or Leak Procedures

STEPS FOR MATERIAL SPILLAGE:
Collect large spills with shovel, dry sand and/or absorbant material. Clean spill area with detergent solutions. Provide adequate ventilation during clean-up.
WASTE DISPOSAL METHODS:
Dispose in accordance with local, state and federal regulations.

Section IX - Special Protection Information

RESPIRATORY PROTECTION:
Not required under normal usage. If product handling creates a vapor or mist, then use half-mask or full piece respirator with replaceable cartridge filter.
VENTILATION:
Adequate ventilation in accordance with good engineering practice must be provided to keep any oil mist below the PEL.
PROTECTIVE GLOVES:
Gloves should be made available to avoid prolonged or repeated skin contact.
EYE PROTECTION:
Safety eye protection equipment should be made available when working presses to avoid splashing into eyes
OTHER PROTECTIVE EQUIPMENT:
General good hygiene practices should be enforced. Hands and face should be washed with soap and water before smoking or eating.

Section X - Special Precautions

H/ DLING AND STORAGE PRECAUTIONS:
Containers should be closed when not in use and stored away from heat, open flame, and oxidizing materials.
OTHER PRECAUTIONS:
Do not wear contaminated clothing. Launder before reuse. Wash skin thoroughly with soap and water and/or waterless skin cleanser after handling.

Authorized Signature: Richard A. Hoch

Date: 11/3/86

Title: Environmental Coordinator

Circulation Area

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

OMB No. 44-R1387

MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
AMERICAN STENCIL MFG. CO., INC.	(312) - 437-9800

ADDRESS (Number, Street, City, State, and ZIP Code)
1603 W. ALGONQUIN ROAD MT. PROSPECT, IL 60056

CHEMICAL NAME AND SYNONYMS	TRADE NAME AND SYNONYMS
METHANOL	SURE-RITE DUPLICATOR FLUID
CHEMICAL FAMILY	**FORMULA**
ALCOHOL	CH_3OH

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS METHANOL	95	200	FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)

SECTION III - PHYSICAL DATA

BOILING POINT (°F.) 64.5° C	148°F	SPECIFIC GRAVITY (H_2O=1) 20/20°C	0.7927
VAPOR PRESSURE (mm Hg.) 20°C	91MM	PERCENT, VOLATILE BY VOLUME (%)	
VAPOR DENSITY (AIR=1)	1.11	EVAPORATION RATE (_____ =1)	5.2
SOLUBILITY IN WATER			
APPEARANCE AND ODOR	COLORLESS LIQUID - SLIGHT ALCOHOL-LIKE ODOR		

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	FLAMMABLE LIMITS	Lel	Uel
60°F T.O.C.	%by volume of air	6.0	36.5

EXTINGUISHING MEDIA
CARBON DIOXIDE, DRY CHEMICAL, WATER FOG OR "ALCOHOL-TYPE" FOAM

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS
CAN REACT VIGOROUSLY WITH OXIDIZING MATERIALS

(Continued on reverse side)

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE
200 PPM (260 MG/M^3)

EFFECTS OF OVEREXPOSURE
IRRITATION OF MUCOUS MEMBRANES & SYMPTOMS OF SYSTEMIC DISTURBANCES. TOXICITY WHICH INCLUDES WEAKNESS, FATIGUE, DIZZINESS, HEADACHES, G.I. & INEBRIATION.

EMERGENCY AND FIRST AID PROCEDURES
REMOVE CONTAMINATED CLOTHES & WASH SKIN WITH SOAP & WATER. IRRIGATE EYES THOROUGHLY WITH WATER. REMOVE FROM CONTAMINATED ATMOSPHERE AND GIVE ARTIFICIAL RESPIRATION & OXYGEN IF NECESSARY

SECTION VI - REACTIVITY DATA

STABILITY			CONDITIONS TO AVOID
	UNSTABLE		
	STABLE		

INCOMPATABILITY *(Materials to avoid)*
INORGANIC ACIDS, ALDEHYDES & ISOCYANATES

HAZARDOUS DECOMPOSITION PRODUCTS

HAZARDOUS POLYMERIZATION			CONDITIONS TO AVOID
	MAY OCCUR		
	WILL NOT OCCUR		

PROCEDURES BELOW ARE PRIMARILY FOR LARGE QUANTITIES.

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
ONLY PROPERLY PROTECTED PERSONNEL SHOULD REMAIN IN THE AREA. LEAKING CONTAINERS SHOULD BE REMOVED TO THE OUTDOORS OR TO AN ISOLATED WELL VENTILATED AREA, AND THE CONTENTS TRANSFERRED TO OTHER SUITABLE CONTAINERS.

WASTE DISPOSAL METHOD
ALL SPILLS HSOULD BE FLUSHED AWAY WITH WATER. HOWEVER, LARGE AMOUNTS SHOULD NOT BE ALLOWED TO ENTER DRAINS OR SEWERS WHERE THERE MIGHT BE DANGER OF VAPORS BEING IGNITED.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION *(Specify type)*
SELF-CONTAINED BREATHING APPARATUS, POSITIVE PRESSURE HOSE MASK, AIRLINE MASK.

VENTILATION	LOCAL EXHAUST	SPECIAL
	MECHANICAL *(General)* HOOD ENCLOSURES & DOWNDRAFT EXHAUST EQUIPMENT WHERE GENERAL	OTHER VENTILATION IS INADEQUATE

PROTECTIVE GLOVES	EYE PROTECTION
RUBBER OR OTHER IMPERVIOUS MATERIAL	CHEMICAL SAFETY GOGGLES

OTHER PROTECTIVE EQUIPMENT
RUBBER CLOTHING TO GUARD AGAINST SPLASHES.

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
THE MOST IMPORTANT FACTOR IN PREVENTION OF INJURY FROM METHANOL IS AVOIDANCE OF ORAL INTAKE & PROLONGED BREATHING OF CONCENTRATED VAPORS SHOULD BE AVOIDED.

OTHER PRECAUTIONS
PROLONGED OR REPEATED CONTACT BY LIQUID OR VAPOR WITH THE SKIN. ALL SOURCE OF IGNITION SHOULD BE REMOVED FROM THE STORAGE & HANDLING AREA. SPARK RESISTANT TOOLS SHOULD BE USED.

GPO 934-190

Material Safety Data Sheet Interpretation Guide

out of the ANPA guide(1)

MATERIAL SAFETY DATA SHEET
INTERPRETATION GUIDE

Material Safety Data Sheet
Interpretation Guide

SUMMARY

This guide provides a review of Material Safety Data Sheets (MSDS), and attempts to make them understandable to individuals with limited technical backgrounds in chemistry, industrial hygiene and fire safety.

The guide is divided into sections similar to those of a typical MSDS. Each piece of information included in the nine sections of a MSDS is discussed in the guide. As an alternative to studying the entire guide, specific questions about MSDS can be answered by referring to the appropriate section of the guide. The guide uses a **fictional** product called **EZ Clean** to illustrate representative information that appears on MSDS. The discussion of information in the individual sections, along with the **Glossary of Common MSDS Terms** found at the end of the guide, should provide answers for most employee questions on MSDS.

MSDS Interpretation Guide

TABLE OF CONTENTS

INTRODUCTION

This guide is intended to help newspaper personnel understand and interpret the information on Material Safety Data Sheets (MSDS) that are supplied by chemical manufacturers and distributors. Since much of the information on MSDS is technical in nature, the sheets can be confusing unless an employee learns how MSDS work. The guide will assist employees with the evaluation of the MSDS information that is of importance to their jobs.

The relationship between the chemical and the job is of particular importance because chemicals behave differently under different conditions. It is possible for a chemical to be very dangerous in the way it is used for one job, and fairly safe when used in another way. As a simple example of this point, consider kerosene which may be used to clean equipment. When kerosene is used at room temperature and on cold equipment, it presents little fire hazard. However, if kerosene were to be used on hot equipment, the risk of fire significantly increases since flammability is temperature dependent.

Likewise, there are other aspects of chemicals that vary with the circumstances of their use. Carbon monoxide is deadly at certain known concentrations; however, at concentrations below these levels, carbon monoxide is relatively harmless. Similarly, table salt is usually considered harmless, but for individuals with high blood pressure it may contribute to serious health problems if ingested.

This Interpretation Guide will break down MSDS into parts and then discuss the meaning of the many special terms used. The purpose is to gain familiarity with the MSDS and to provide a basis for understanding the hazards that affect employees. Not all MSDS will look the same, but all must indicate certain required information. A representative blank MSDS follows:

MATERIAL SAFETY DATA SHEET

SECTION I

Manufacturer's Name: Emergency Telephone No.:

Address:

Product Name:

Chemical Family: Trade Name and Synonyms:

SECTION II: HAZARDOUS INGREDIENTS

Chemical Components	% Conc.	Exposure Limits
_____	--%	----ppm
_____	--%	----ppm
_____	--%	----ppm
_____	--%	----mg/cu.m.
_____	--%	----mg/cu.m.

SECTION III: PHYSICAL DATA

Boiling Point (degrees F): Specific Gravity (H_2O = 1):

Vapor Pressure (mm Hg): Percent Volatile (% volume):

Vapor density (air=1): Evaporation Rate:

Solubility in Water: pH:

Appearance and Odor:

SECTION IV: FIRE AND EXPLOSION HAZARD

Flash Point (method): Flammability Limits — Upper:

Extinguishing Media: — Lower:

Special Fire Fighting Procedures:

Unusual Fire and Explosion Hazards:

SECTION V: HEALTH HAZARD DATA

Threshold Limit Value (TLV):

Effects of Overexposure:

Emergency and First Aid Procedures:

SECTION VI: REACTIVITY DATA

Product Stability: Conditions to Avoid:

Incompatibilities:

Hazardous Decomposition Products:

Hazardous Polymerization: Conditions to Avoid:

SECTION VII: SPILL OR LEAK PROCEDURES

Spill Response Procedures:

Waste Disposal Methods:

SECTION VIII: SPECIAL PROTECTION INFORMATION

Respiratory Protection:

Ventilation:

Gloves: Eye Protection:

Other Protective Equipment:

SECTION IX: SPECIAL PRECAUTIONS

Storage & Handling:

Other Precautions:

The following pages include a breakdown of MSDS by sections. Hypothetical information for a fictional product, **EZ Clean,** is used throughout.

SECTION I

Manufacturer's Name:
ANY OLD Chemical Co.
Address:
9876 Apple St.
Big Apple, NY 12345
Product Name: EZ Clean
Chemical Family:
Aliphatic Petroleum Distillates

Emergency Telephone No.:
800/555-1234
(Example only)

Trade Name and Synonyms:
Varsol, Stoddard Solvent

- **Manufacturer's Name, Address and Product Name** — These items are self-explanatory.

- **Emergency Phone Number** — This can be used in case of an emergency to get important information. For example, what to do if a large spill occurs or if someone is accidentally poisoned or overexposed.

- **Chemical Family** — Chemicals are divided into groups or families that are related by chemical structure. This is useful information because related chemicals tend to behave similarly. Many chemical products are actually mixtures of chemicals. **EZ Clean** is a mixture of aliphatic petroleum distillates; these are lightweight petroleum products somewhat similar to kerosene. In many ways it is easier to think about it as a member of this family than it is to think about the different chemicals it contains.

- **Trade Names and Synonyms** — Certain commonly used chemicals have generic or trade names that identify the product. To illustrate this point, **Kleenex** was originally the name of one particular product. However, it is now frequently used to refer to any brand of facial tissue. Often chemical companies make up a product name to get special recognition in the marketplace. The terms Varsol and Stoddard Solvent are good examples. In some cases, trade name and synonym information is useful when relaying the identity of a chemical to emergency response personnel.

SECTION II: HAZARDOUS INGREDIENTS

Chemical Components	% Conc.	Exposure Limits
Stoddard Solvent	100%	500ppm
_____	--%	----ppm
_____	--%	----mg/cu.m.

- **Chemical Components** — Indicates the individual chemicals in the product that are regulated by OSHA or other agencies and groups concerned with hazardous materials. These will often be specific chemicals, but sometimes mixtures are indicated. In the case of **EZ Clean,** the mixture **Stoddard Solvent** is indicated on the MSDS since it is regulated by OSHA as a mixture. A few examples of mixtures that could be found on MSDS include naphtha (a petroleum product similar to kerosene), alkyl t-quaternary amonium chlorides (detergents) and freon (any of several fluorocarbons). Chemical components are sometimes considered **trade secrets.** If they are bona fide trade secrets, the manufacturer is not required to identify the names of these chemicals on the list. The list will include a statement such as **proprietary materials.** In an emergency, an appropriate official should be able to obtain the trade secret ingredients by calling the Emergency Telephone Number listed on the MSDS in Section I.

- **Percent Concentration (% Conc.)** — Indicates the proportion of a chemical used in the product. **EZ Clean** is only composed of Stoddard Solvent so the percent concentration is indicated as 100%. Many products will contain different chemicals and percentages must be indicated for each chemical. **Inert** materials, such as water, may be listed as inert or may not be listed at all. In some cases, the manufacturer may list a chemical but indicate that the concentration in the product is a trade secret.

- **Exposure Limits** — Indicates the limits set by OSHA on the amount of chemical that an employee can safely be exposed to on the job. Usually this is expressed as an air concentration, but sometimes other factors, such as skin contact, are considered. An exposure limit is normally expressed as a **time-weighted average (TWA)** for an 8-hour workday. This means that the amount of the chemical in the air can be greater than the limit at any one time, but the average exposure for the entire workday must be below the limit. Occasionally, the limits that appear on MSDS come from other agencies, such as the National Institute for Occupational Safety and Health (NIOSH) and the American Conference of Governmental Industrial Hygienists (ACGIH). These are normally used if OSHA does not currently regulate a chemical or because these limits are stricter and may be adopted by OSHA in the near future.

- **PPM and MG/CU.M.** — Units used for expressions of the quantity or concentration of a chemical in air. **PPM** is short for parts per million, which essentially means the number of molecules of chemical per million total molecules of gas in the air. **MG/CU.M.** is short for milligrams per cubic meter (**mg/M^3**). This is similar to ppm but preferred for certain chemicals that are not usually found as gases. It indicates the weight of the chemical contained in a cubic meter of air. Highly toxic chemicals will have very low exposure limits, such as 0.1 ppm or 0.25 mg/M^3. Less toxic chemicals will have higher exposure limits, such as 1000 ppm or 1800 mg/M^3. The concentrations of many chemicals can be expressed in both units. The Stoddard Solvent used in **EZ Clean** is a good example. The OSHA Standard for Stoddard Solvent is 500 ppm or 2950 mg/M^3. Although the numbers are different, 500 ppm of Stoddard Solvent is equivalent to 2950 mg/M^3. Another unit used occasionally to express air concentrations of certain dusts is **mppcf** which stands for millions of particles per cubic foot of air.

SECTION III: PHYSICAL DATA

Boiling Point (degrees F): 302-399°F	**Specific Gravity (H_2O = 1):** 0.80
Vapor Pressure (mm Hg): 0.8	**Percent Volatile (% volume):** 100%
Vapor Density (air = 1): 5.0	**Evaporation Rate:** 0.10 (BuAc = 1)
Solubility in Water: < **0.01 g/100g**	**pH:** N/A

Appearance and Odor: Colorless liquid. Kerosene-like odor.

- **Boiling Point (degrees F)** — Indicates the temperatures at which a chemical product boils. This temperature is either expressed in units of **degrees F** (Fahrenheit) or **degrees C** (Celsius or Centigrade). These are the two most common temperature scales. The boiling temperature of the material may be critical to the manufacture of a product. Certain processes intentionally boil chemicals (in distilling alcohol, for example). Other processes may need to be hot but not boiling. The boiling point of a chemical product also may be a safety consideration. For many workers, however, boiling point does not affect their job. More important to many jobs is the **flash point** of chemical products. The flash point of a chemical product is indicated on a MSDS in Section IV. Additional information on flash point is covered in the glossary and Section IV of this guide.

- **Specific Gravity (H_2O = 1)** — Indicates how heavy a liquid chemical is when compared to water (H_2O) which is assigned a value of 1 (i.e., H_2O = 1). Some chemicals are heavier and some lighter. **EZ Clean** is lighter than water, meaning that it would float on top of water if it does not dissolve in the water. Other chemicals, such as chlorinated solvents, are heavier than water. The number in this space might be 1.12 for a chlorinated solvent. The specific gravity of most solvent chemicals is usually close to one. Another important aspect of specific gravity is that if a chemical spill occurs involving water, the chemical may be found either above or below the water assuming that it is not miscible. If a chemical is flammable and on top of the water, a fire or exposure hazard may exist.

- **Vapor Pressure (mm Hg)** — Indicates the potential for the chemical to vaporize in air. If a chemical is flammable, vapor pressure may be significant in terms of fire hazard. Most highly flammable chemicals have relatively high vapor pressures. The unit **mm Hg** means millimeters of mercury. It is the same unit used for barometric pressure. The larger the number, the higher the vapor pressure, and the greater the amount of the chemical that will tend to be in the air. **EZ Clean** has a fairly low vapor pressure. Many solvents have high vapor pressures. When a chemical has no vapor pressure you will see **not applicable (N/A)** or **negligible** in this space. Heavy lubricating oils, for example, have almost no vapor pressure.

- **Percent Volatile (% volume)** — This term is used to indicate what portion of a chemical product will readily become a vapor at relatively low temperatures. **EZ Clean** is 100% volatile. However, when some of the chemicals in a product are volatile, and some are not, this number will be less than 100%. Heavy oils may show 0%. Paint, as another example, may indicate 30%, depending on the amount of thinner contained in the paint.

- **Vapor Density (air = 1)** — Indicates the relative weight of chemical product vapors when compared with air which is assigned a value of 1 (i.e., air = 1). Most chemicals in a vapor or gas form tend to mix with air. However, if left undisturbed, many chemicals will migrate up or down in air. Layers will form much like the liquid layers that form in oil and vinegar salad dressing. **EZ Clean** with a vapor density of 5.0 is five times heavier than air and it will tend to sink. Chemicals with numbers below one are lighter than air and will tend to dissipate into the atmosphere. In **confined spaces,** such as empty chemical storage tanks, vapors of chemicals heavier than air will tend to settle in the bottom of the tank. This is the primary reason for industrial accidents involving suffocation. Vapor density may also be important in the event of fires or chemical spills. If emergency response personnel must enter an area with a potential suffocation risk, they need self contained respirators to provide clean air.

- **Evaporation Rate** — This rate indicates how fast a chemical will go from a liquid to a vapor at a specific temperature. Chemicals with high evaporation rates usually have high vapor pressures. Like vapor pressure, the evaporation rate influences exposure and fire hazards. The rate is expressed relative to a standard solvent such as butyl acetate which is assigned a value of 1 (i.e., BuAc = 1). If the chemical product evaporates faster than the standard solvent, the number will be greater than one; if slower, it will be less than one. **EZ Clean** with a rate of 0.10 evaporates 10 times slower than the standard solvent, and also has a lower vapor pressure than the solvent.

- **Solubility in Water** — Indicates how miscible the chemical product is in water. Certain chemicals dissolve readily in water, while others only partially dissolve or do not dissolve at all. Solubility is of primary importance in spill situations where clean up procedures often depend on water solubility. For environmental purposes, water soluble chemicals are often considered potentially serious hazards, because they could rapidly migrate in soil following an undetected spill. Less than 0.01 grams of **EZ Clean** will dissolve in 100 grams of water (i.e., $<$ 0.01g/100g) which means it is not very soluble in water.

- **pH** — This term indicates the acidic or caustic (alkaline) nature of a chemical. The number will range from 1 to 14. Lower numbers indicate increasing acidity and higher numbers indicate increasing alkalinity. In the middle are neutral chemicals like water which have pH values of about 7. Chemicals that have pH characteristics are almost always water soluble. Since **EZ Clean** is not water soluble, it does not have a pH. Strong acids and caustics are potentially dangerous when handled improperly. They can damage skin on contact, and the lungs if inhaled.

- **Appearance and Odor** — This information can occasionally be useful when working with chemicals. Some products have a characteristic appearance or odor that can be used to identify the chemical. Often, the odor is described as being like some other common odor or fragrance. In the case of **EZ Clean,** the product has a smell like kerosene.

SECTION IV: FIRE AND EXPLOSION HAZARD

Flash Point (method):
100-110 degrees F (TCC)

Flammability Limit—Upper: 6.0%
—Lower: 1.0%

Extinguishing Media: Foam, CO_2, dry chemical

Special Fire Fighting Procedures: Use self contained breathing equipment for enclosed areas.

Unusual Fire and Explosion Hazards: Combustible liquid do not store with strong oxidizers.

- **Flash Point (method)** — The flash point of a chemical or mixture is the lowest temperature at which the material will **flash** or ignite when exposed to flame. Stated another way, it is the lowest temperature at which a liquid will produce sufficient vapor to burn. It is actually the vapor, not the liquid, that burns. Many chemicals have a specific flash point temperature below which they will not burn. Mixtures of chemicals often have variable flash points that will be expressed as a range. **EZ Clean** is a mixture and has a flash point with a 10 degree F (Fahrenheit) temperature range. This means **EZ Clean** will flash somewhere in the range of 100 to 110 degrees Fahrenheit. It will definitely flash if the temperature is higher. Some chemicals do not flash at all, and others, such as heavy oil, will flash only at very high temperatures. MSDS for non-flammable materials will indicate not applicable (N/A) in this space. Chemicals with high flash points may have a **greater than** function (e.g., 400). Some MSDS indicate flash point temperatures in **degrees C** (Centigrade or Celsius). There are four accepted methods of testing flash point. The Tag Closed Cup (TCC or CC) is normally the preferred method. However, the Tag Open Cup (TOC), Cleveland Open Cup (COC) and Pensky-Martens (PM) methods are also widely used to test flash point.

- **Flammability Limits** — The upper and lower flammability limits indicate the range of air concentrations in which the vapors will ignite or explode. This range is often referred to as the explosive range. At concentrations in air below the lower limit there is not enough vapor in the air to burn. At concentrations in air above the upper limit, there is not enough oxygen in the air to support combustion of the vapor. The lower limit is sometimes called the **lower explosive limit (lel).** The upper limit is sometimes called the **upper explosive limit (uel).**

- **Extinguishing Media** — Indicates the proper type of fire extinguishing media. Many chemical fires cannot be put out with water. The use of water can also make some chemical fires worse. Since most newspapers have several types of extinguishing media available, this information is important and tells which type should be used. Being familiar with this information before a fire is necessary to prevent extensive fire damage and personal injury. The most widely used extinguishing media include water, carbon dioxide (CO_2), foam, bicarbonate of soda, multipurpose dry chemical, loaded steam and HALON.

- **Special Fire Fighting Procedures** — Indicates any special equipment needed to protect firefighters from toxic products of combustion.

- **Unusual Fire and Explosion Hazards** — Indicates special fire or explosion hazards which may not be covered in other sections of the MSDS.

SECTION V: HEALTH HAZARD DATA

Threshold Limit Value (TLV): OSHA **PEL** = 500 ppm or 2,950 mg/cu.m
Recommended ACGIH **TWA** = 400 ppm or 2,360 mg/cu.m

Effects of Overexposure: Skin — dermatitis, irritation
Eye — irritation
Inhalation — headache, dizziness, nausea, narcosis

Emergency and First Air Procedures: Skin — wash with soap and water, apply hand cream
Eye — irrigate with water, consult physician
Inhalation — fresh air, consult physician

- **Threshold Limit Value (TLV)** — Indicates the standards for chemicals contained in the product. In the case of mixtures of distinct chemicals, individual threshold limit values (TLVs) may be shown for each chemical. However, manufacturers frequently indicate a TLV for the entire mixture by averaging the proportional TLVs for each chemical or by selecting the lowest TLV of the various chemicals contained in the product. For certain mixtures, there may be no TLV and not applicable (N/A) will be indicated in this space.

- **PEL / TWA**—The most common TLV is a **time-weighted average (TWA)**. OSHA has established TWA exposure limits for many chemicals. These are commonly referred to as **permissible exposure limits (PEL).** OSHA PEL are the legal occupational exposure limits applicable to newspapers. The American Conference of Governmental Industrial Hygienists (ACGIH) also has established TWA which are recommended exposure limits. PEL and TWA values normally refer to 8-hour time-weighted average exposures. This means the average exposure level for one 8-hour workday. Actual exposures may be above the PEL or TWA at any given moment providing the average exposure for the day does not exceed the PEL or TWA. Some chemicals have a **ceiling limit ("C" or Ceil)** value instead of a regular PEL or TWA. These limits indicate the highest level of allowable exposure at any time during the workshift. Ceiling limits do not have a time period associated with them. However, some chemicals with ceiling limits have what are known as **peak** limits. These peak limits are higher than the ceiling limits and they always have a time period associated with them (e.g., 100 ppm for 10 minutes). The ACGIH has developed a TLV called the **short-term exposure limit (STEL).** It is similar to a peak limit, but is always associated with a 15-minute time period. Chemicals with a STEL always have a TWA.

- **Effects of Overexposure**—Indicates a list of medical symptoms that may be observed if an individual is overexposed. The information also indicates effects that may occur with skin or eye contact. Many of the symptoms associated with inhalation are rarely seen unless the TLV is exceeded. Skin or eye contact with **EZ Clean** can cause irritation. Gloves should be used in appropriate situations to avoid direct skin contact which could eventually cause dermatitis (chronic skin irritation). Goggles should be used in situations where **EZ Clean** may splash. The more serious inhalation effects such as headache, dizziness, nausea and narcosis (inebriation and unconsciousness) are rarely seen providing the chemical product is used in open work areas, according to the manufacturer's instructions, for the purpose it was intended. Appropriate precautions should be taken whenever chemicals are used in confined areas. Many additional symptoms associated with overexposure and commonly used on MSDS are listed in the **MSDS Interpretation Guide Glossary of Common MSDS Terms.**

- **Emergency and First Aid Procedures** —These procedures indicate the immediate medical attention that should be given to a person exhibiting the effects of overexposure. If an individual exhibits symptoms of overexposure when working with a chemical product, fresh air is needed and the employee should discontinue working with the product until the cause of the problem is found and corrected. In cases of serious overexposure, a physician should always be promptly consulted. When in doubt about the possibility of a serious overexposure, **ALWAYS CONSULT A PHYSICIAN!** If an individual has dermatitis, a treatment for skin irritation should be recommended by a physician and steps should be taken to prevent future skin contact (i.e., require use of protective gloves).

SECTION VI: REACTIVITY DATA

Product Stability: Stable **Conditions to Avoid:** N/A

Incompatibilities (materials to avoid): Strong oxidizing agents

Hazardous Decomposition Products: Carbon dioxide, carbon monoxide

Hazardous Polymerization: N/A **Conditions to Avoid:** N/A

- **Product Stability/Conditions to Avoid** — Indicates information about the chemical and physical stability of the product. Most chemical products are stable, meaning they are not likely to undergo violent reactions in most storage and handling situations. Unstable chemicals are very likely to undergo violent reactions under normal conditions unless special precautions are taken to prevent these reactions. This space on the MSDS will typically indicate that the product is either **stable** or **unstable.** Some chemicals may be designated as mildly unstable. **EZ Clean** is stable under normal conditions. Unstable chemicals will have a list of **Conditions to Avoid.** These are the conditions that could cause an uncontrolled or violent reaction. The types of conditions commonly indicated in this space include **Avoid heat, Do not expose to air, Do not allow contact with metal, Do not mix with strong acids,** or **Handle with extreme caution do not shock.** Any warnings in this section should be followed to the letter. Improper handling of unstable chemicals can be disastrous. Stable products like **EZ Clean** will often have entries like not applicable (N/A) in this space. However, the MSDS of some **stable** products may indicate certain conditions to avoid and these should be given appropriate attention.

- **Incompatibilities (materials to avoid)** — Indicates the types of chemicals or materials that must not come in contact with the product. Many chemicals are only reactive when they come in contact with certain other materials or chemicals. **EZ Clean** may react with strong oxidizers. Strong oxidizers are substances that rapidly react with (oxidize) certain other substances to gain electrons. Examples of strong oxidizers include hydrogen peroxide, sulfuric acid and chlorine. Strong acids or bases, aldehydes, metals, water, air and chlorinated organics are examples of other types of materials that may be indicated on MSDS in this space. Incompatible chemicals should never be used together or in the same area. It is also a good idea to avoid storing incompatible chemicals near one another.

- **Hazardous Decomposition Products** — Indicates any dangerous chemicals that could be produced in an uncontrolled reaction. Often these decomposition products will be much more hazardous than the original product. This information is especially important if extremely toxic chemicals are produced by the reaction. When an uncontrolled reaction occurs and results in a release of extremely toxic products, evacuation of the building may be necessary. Like the **EZ Clean** MSDS, this space will often list carbon monoxide, carbon dioxide and other chemicals that result from burning the product.

- **Hazardous Polymerization/Conditions to Avoid** — Indicates if chemicals in the product can react with themselves to form a **polymer.** Polymers are groups of chemicals **stuck** together. Plastics are the best known type of polymer. Polymers are usually not dangerous; however, the process of forming a polymer can involve a hazardous reaction that produces considerable heat and pressure. Usually some **trigger** is required to cause uncontrolled polymerization. These triggers will be listed on the MSDS as the **Conditions to Avoid.** Hazardous polymerization is not a common problem with the types of products used by newspapers.

SECTION VII: SPILL OR LEAK PROCEDURES

Spill Response Procedures: Small spills — spread absorbent, dispose of waste as a flammable material. Large spills — evacuate unnecessary personnel, contain spill, ventilate area, mop up and collect liquid in a sealed container.

Waste Disposal Methods: Recycle or landfill in accordance with local and federal regulations.

- **Spill Response Procedures**—Indicates instructions for handling a chemical spill.Most chemicals can be cleaned up in a simple manner, providing the spill is not large. A spill of highly toxic chemicals will probably necessitate clean-up by an emergency response team. The area should be evacuated of all unnecessary personnel. Some chemical spills may require the use of supplemental local exhaust ventilation during a clean-up.

- **Waste Disposal Methods** — Indicates general information about waste disposal methods. Some newspapers have set procedures for disposal of routine operating waste. If the waste resulting from a spill is similar to operating waste, handle it in the same manner. Appropriate caution should always be used when disposing of flammable or reactive chemicals.

SECTION VIII: SPECIAL PROTECTION INFORMATION

Respiratory Protection: Organic vapor cartridge mask if TLV is exceeded.

Ventilation: Standard room ventilation, supplement with appropriate local exhaust ventilation if TLV is exceeded.

Gloves: Rubber or Synthetic **Eye Protection:** Safety Glasses

Other Protective Equipment: N/A

- **Respiratory Protection** — Indicates appropriate protection for use if chemical overexposure is probable. This protection is not usually required for routine work with most chemical products. Listings of respiratory protection on MSDS should indicate the conditions or special circumstances that would require use of the protection. For jobs that require the routine use of respiratory protection, specific types will be listed and a respirator program will be required.

- **Ventilation** — Indicates the necessary ventilation for work with chemical products. The standard ventilation required for any area where people are working is sufficient for the use of many chemicals. **EZ Clean** does not evaporate rapidly; therefore, it does not accumulate in the air. Standard ventilation is sufficient in most instances to dilute and remove it. However, the manufacturer of **EZ Clean** recommends supplemental ventilation if the TLV is exceeded. This will probably not occur very often and when it does it is likely to occur under unusual circumstances. The use of **EZ Clean** in confined spaces is a good example of a situation that may necessitate the use of supplemental local exhaust ventilation. The manufacturers of some products know, based on the chemical and physical characteristics of their products, that supplemental local exhaust ventilation will be needed in most situations. The MSDS of this type product may contain a notation like **local exhaust ventilation is required.**

- **Gloves** — Indicates the specific type of gloves needed for work with the chemical. Some gloves will not provide adequate protection for certain chemicals. When work involves direct hand contact with chemicals, appropriate gloves must be worn unless this space on the MSDS is marked not applicable (N/A).

- **Eye Protection** — Indicates the appropriate eye protection that must be used if there is any possibility of splashing chemicals in the eyes. There are three main types of eye protection: safety glasses, goggles and face shields. Protection should be used as indicated on MSDS.

- **Other Protective Equipment** — Information is rarely entered in this space. Only very toxic chemicals used in special situations require additional protective equipment. Newspapers do not commonly use such products.

SECTION IX: SPECIAL PRECAUTIONS

Storage & Handling: Avoid extreme temperatures, sparks and open flame.

Other Precautions: N/A

- **Storage & Handling** — Indicates information about the safe storage and handling of the product. Special information for reactive and highly toxic chemicals may also appear in this space. Since **EZ Clean** is flammable it should be stored away from sources of ignition. Other information that might appear in this space includes **Do not store in metal containers, Do not expose to air** and **Keep refrigerated at all times.**

- **Other Precautions** — This space often indicates not applicable (N/A), but is sometimes used for very specialized information on certain chemicals. Information in this space may include instructions about use with other chemicals or special situations where an extraordinary hazard may exist. Some manufacturers use this space for information like **Keep Away From Children** or **Do Not Puncture.**

MSDS Interpretation Guide

GLOSSARY OF COMMON MSDS TERMS

—A—

Absolute Alcohol — Ethyl alcohol containing not more than 0.2 percent water by weight.

Acute Effect — An adverse health effect with a rapid onset. A simple example of an acute effect is an acid burn, which causes almost immediate skin irritation.

Acute Toxicity — The adverse health effects resulting from a single- or short-term **overexposure** to a substance.

ACGIH — American Conference of Governmental Industrial Hygienists

Alcohols — Family of hydrocarbon compounds containing one hydroxyl (-OH) group. In general, alcohols are irritating to mucous membranes and usually produce some narcotic effect.

Aldehydes — Family of relatively reactive hydrocarbon compounds bonded with oxygen. These compounds are potential eye, skin and respiratory system irritants. Aldehydes are widely used in many chemical manufacturing and refining processes because of their reactive nature which means they can be used to produce a number of other chemicals.

Aliphatics — A large group of organic chemicals composed primarily of carbon and hydrogen. Aliphatics are common in petroleum products and they are major ingredients of products like gasoline, paint thinner and natural gas.

Aliphatic Amines — Family of hydrocarbon compounds which are derivatives of ammonia (NH_3). These chemicals tend to have the characteristic ammonia smell. Aliphatic amines are often strongly alkaline (caustic) compounds which may be highly irritating to the eyes, skin and respiratory systems.

Amines — See aliphatic amines.

Ambient Conditions — Normal or typical surrounding temperature and pressure conditions.

ANSI — American National Standards Institute

Anoxia — A deficiency of oxygen in the blood. Overexposure to certain chemicals may cause anoxia. Carbon monoxide, for a simple example, bonds with blood hemoglobin and prevents it from taking oxygen to the cells.

Aromatic Hydrocarbons — Group of organic chemicals composed of carbon and hydrogen. Each chemical in the group has one six-member carbon ring which is known as an aromatic nucleus or benzene ring. Benzene, toluene and xylene are three of the many types of aromatic hydrocarbons.

Asphyxiants — Vapors and gases which may cause unconsciousness or death by suffocation (a lack of oxygen). Most simple asphyxiants are only harmful to the body when they become so concentrated that the amount of oxygen in the air is reduced to dangerous levels (18% or lower). Asphyxiation is one of the principal potential hazards of working in confined spaces.

Asphyxiation — Suffocation, see asphyxiants.

Atomic Weight — Indicates the relative weight of chemical atoms (elements) when compared with the weight of hydrogen atoms (e.g., carbon is 12 times heavier than hydrogen so the atomic weight of carbon is 12).

Autoignition Point — The initial temperature at which a substance will initiate self combustion in the absence of an ignition source.

—B—

Boiling Point — The temperature at which a liquid changes to a vapor state at a given pressure. Boiling point is usually expressed in degrees F at a pressure of 760 mm Hg (one atmosphere). Each liquid has a different boiling point at a given pressure. MSDS for chemical mixtures may indicate the **initial** boiling point of the product or the **boiling range** of the various components.

Butyl Cellosolve — See glycol ethers.

—C—

C, °C — The letter C has three meanings for the different contexts in which it is used. These meanings include carbon when used in conjunction with chemical formulas, degrees Centigrade or Celsius (°C) when used to indicate temperature and ceiling level when used in conjunction with chemical exposure standards.

Carcinogen — A chemical, substance or agent capable of causing or producing cancer.

Carbon Dioxide — See CO_2.

Carbon Monoxide — See CO.

CAS, C.A.S. — Chemical Abstracts Service is an organization which indexes information published by the American Chemical Society in **Chemical Abstracts.** The company develops index guides used to locate information about the individual chemicals published in the Abstracts. **CAS Numbers** are unique numbers, assigned by the Service, which identify specific chemicals. Some MSDS include these numbers for chemicals as a way of identifying obscure chemicals or to clarify the identity of chemicals with unusual or misleading names.

cc — Cubic centimeter is a metric unit of volume equivalent in capacity to one milliliter (ml). One quart is roughly equal to 946 cubic centimeters.

CC — See TCC.

Ceiling, "C" or Ceil — A type of chemical exposure standard established by OSHA and ACGIH which indicates the maximum allowable exposure level for a given chemical. Most chemicals do not have ceiling limits.

Cellosolve — Synonym for 2-ethoxyethanol (ethylene glycol monoethyl ether) which is a member of the glycol ether chemical family. See glycol ethers.

Cellosolve Acetate — See glycol ethers.

Chemical Anoxia — See anoxia.

Chemical Family — A group of chemicals that are structurally related. The chemicals of a given family often have similar component parts and chemical characteristics. Many chemical families are listed in the **HAZPAK** glossary, a few of them include the alcohols, aldehydes, ethers and ketones.

Chemical Formula — See formula.

Chemical Reaction — See reaction.

CHEMTREC — Chemical Transportation Emergency Center is a national center established by the Chemical Manufacturers Association (CMA). CHEMTREC relays pertinent emergency information concerning specific chemicals. CHEMTREC has a 24-hour toll free telephone number (800-424-9300) for use by those who respond to chemical transportation emergencies.

Chloracne — An acne-like skin problem caused by overexposure to certain chlorinated compounds.

Chlorinated Compounds — Chemical compounds which have one or more chlorine atoms. See halogenated compounds.

Cholinesterase — An enzyme associated with the nervous system.

Chronic Effect — An adverse health effect with symptoms that develop slowly over a long period of time or which recur frequently. A simple example of a chronic effect is cirrhosis of the liver caused by long-term alcohol abuse.

Chronic Toxicity — The adverse health effects resulting from long-term **overexposure** to a substance.

Cleveland Open Cup — See COC.

CMA — Chemical Manufacturers Association

CNS — Central nervous system

CO — Carbon monoxide is a colorless, odorless and tasteless toxic gas produced by the incomplete combustion of carbon.

CO_2 — Carbon dioxide is a heavy, colorless and odorless gas produced by combustion and decomposition of organic substances. CO_2 will not burn and is relatively non-toxic, so it is often used as a fire extinguishing agent.

COC — Cleveland Open Cup is one of several flash point test methods.

Combustible Liquid — See flammable and combustible liquid classifications.

Corneal — Pertaining to the cornea of the eye.

Corrosive — Liquid or solid substances that cause destruction or alterations of skin at the site of contact. Acids, alkalies and oxidizers are examples of corrosive substances.

Cutaneous — Pertaining to the skin.

Cutaneous Toxicity — See Dermal Toxicity.

—D—

Decomposition — Breakdown of a material or substance by heat, chemical reaction, electrolysis, decay or other processes.

Degrees C — Degrees Centigrade or Celsius (°C)

Degrees F — Degrees Fahrenheit (°F)

Dermal — Relating to the skin.

Dermal Toxicity — Adverse health effects resulting from overexposure of the skin to a substance.

Dermatitis — An inflammation of the skin. Dermatitis has many causes including disease, allergies and chemical overexposure. Many industrial chemicals can cause dermatitis when they are used without appropriate gloves.

DOL — U.S. Department of Labor

DOT — U.S. Department of Transportation

— E —

Edema — The excessive accumulation of fluid in tissue spaces.

Endocrine — Pertaining to the glands which secrete hormones.

Endocrine Glands — The glands which produce hormones including the pituitary, thyroid, parathyroid, pancreas, adrenal, ovary and testis.

EPA — U.S. Environmental Protection Agency

Epidemiology — The science which deals with the study of diseases and health effects in specific populations in an effort to provide information about the causes.

Esters — A large family of organic chemicals widely used in industry and commerce. Certain esters are found naturally in fruits (e.g., bananas) and account for the smell and taste of the fruit. Other esters are used in soap, perfume and general purpose solvents. Ethyl acetate and butyl acetate are examples of two esters often used in solvents and paints.

Ethers — A large family of organic compounds with many important industrial uses. Ethyl ether, commonly known as **ether,** has been used as a general anesthetic. Certain ethers (e.g., glycol ethers) have commercial uses in solvents, paints, lacquers, cleaning and spotting agents.

Evaporation Rate — A term used to express the relative rate of evaporation for a chemical when compared to the known evaporation rate of a **standard** liquid. The standard liquid is usually **normal butyl acetate** (NBUAC or n-BuAc). Evaporation rates of chemicals derived using n-BuAc are classified as fast, medium and slow using the following guidelines:

FAST Evaporating — Rates greater than 3.0
MEDIUM Evaporating — Rates between 0.8 and 3.0
SLOW Evaporating — Rates less than 0.8.

— F —

F, °F — Fahrenheit when used in the context of temperature.

Fire Classifications — **CLASS A:** Fires involving ordinary combustible materials such as paper, wood and cloth. Also includes some fires involving rubber and plastics.

CLASS B: Fires involving flammable or combustible liquids, flammable gases, greases and similar materials. Also includes some fires involving rubber and plastics.

CLASS C: Fires involving energized electrical equipment.

CLASS D: Fires involving combustible metals such as magnesium or titanium.

Flammable — Non-specific term meaning easily ignited.

Flammable and Combustible Liquid Classifications

CLASS IA FLAMMABLE LIQUIDS
Have flash points below 73°F (22.8°C) and boiling points below 100°F (37.8°C).

CLASS IB FLAMMABLE LIQUIDS
Have flash points below 73°F (22.8°C) and boiling points at or above 100°F (37.8°C).

CLASS IC FLAMMABLE LIQUIDS
Have flash points between 73°F (22.8°C) and 100°F (37.8°C).

CLASS II COMBUSTIBLE LIQUIDS
Have flash points between 100°F (37.8°C) and 140°F (60°C).

CLASS IIIA COMBUSTIBLE LIQUIDS
Have flash points between 140°F (60°C) and 200°F (93.3°C).

CLASS IIIB COMBUSTIBLE LIQUIDS
Have flash points at or above 200°F (93.3°C).

Flammable Gases

Compressed gases which will ignite in air at concentrations of 13% or less by volume. Also those gases which have a flammability range in air of 12% or more regardless of lower flammable limit (lfl).

Flammable Liquids

See flammable and combustible liquid classifications.

Flammable Solids

Solids which ignite readily and burn vigorously as a result of friction, moisture absorption or spontaneous chemical changes.

Flammable Range

The numerical difference between the upper and lower flammable limits.

Flash Point

The initial temperature at which a liquid will produce enough flammable vapor to ignite in the presence of an ignition source. Flash point can be used to categorize the potential fire hazards of flammable and combustible liquids as follows:

Severe Fire Hazards include liquids with flash points below 100°F (37.8°C).

Moderate Fire Hazards include liquids with flash points between 100°F (37.8°C) and 200°F (93.3°C).

Slight Fire Hazards include liquids with flash points above 200°F (93.3°C).

Formula

The shorthand notation used by chemists to identify specific chemicals. A simple example is carbon dioxide which has the chemical formula CO_2.

—G—

g

Gram is a metric unit of weight. One ounce equals 28.35 grams.

General Exhaust Ventilation

A ventilation system for removing air and contaminants from an entire work area.

Glycol Ethers

Group of five related ethers that are colorless liquids with a slight odor. Glycol ethers are occasionally used in solvents, paints, lacquers and cleaning compounds. The synonym **cellosolve** is frequently used for glycol ethers (e.g., methyl cellosolve or cellosolve acetate).

—H—

Halogens — The group of atoms known as halogens includes chlorine, bromine, fluorine and iodine.

Halogenated Compounds — Chemicals that contain one or more halogen atoms (e.g., carbon tetrachloride contains four chlorine atoms).

Hazardous Chemicals — All chemicals listed by OSHA in 29 CFR 1910, Subpart Z, Toxic and Hazardous Substances (i.e., Chemicals with OSHA Standards). All chemicals which have published ACGIH Threshold Limit Values (TLVs) are also considered hazardous chemicals under the OSHA Hazard Communication Standard. Additionally, any chemical which is considered a carcinogen or potential carcinogen by OSHA, NTP (National Toxicology Program) or IARC (International Agency for Research on Cancer).

Hazardous Polymerization — See polymerization.

Hepatic — Pertaining to the liver.

Hydrocarbons — Class of organic compounds that are composed exclusively of carbon and hydrogen atoms. This class of compounds includes several hundred thousand different chemicals.

—I—

IARC — International Agency for Research on Cancer

Ignitable — Capable of being set afire.

Incompatible — Materials which could cause dangerous reactions from direct contact with one another are defined as incompatible.

Industrial Hygiene — The study and control of occupational factors that may cause sickness, impaired health or significant discomfort of employees.

Inebriation — State of intoxication or disorientation characterized by symptoms including loss of balance, lack of coordination or drunken behavior. Inebriation can be caused by excessive exposure to alcohol and certain other organic chemicals. A state of inebriation caused by chemical exposure is often a symptom of overexposure.

Inert — Chemical substances which do not react or are physiologically inactive.

Inflammation — The reaction of tissues to injury or irritation characterized by symptoms (i.e., inflammatory responses) like pain, tenderness, redness, swelling, heat and edema. The symptoms may be confined to the site of injury or irritation (i.e., localized inflammatory responses) or in some cases to the entire body (i.e., systemic inflammatory responses).

Inflammatory Response — See inflammation.

Ingestion — The process of eating, drinking or inadvertent consumption which involves taking a substance into the body through the mouth.

Inhalation — The process of drawing air into the lungs (i.e., breathing).

Inhalation Hazards — The respiratory hazards which may result from overexposure to the gases, vapors, fumes, mists and dusts of many chemicals which enter or affect the body through the respiratory system.

Irritants — Chemical substances which may cause inflammatory responses or reactions of the eyes, skin or respiratory system.

—K—

kg — Kilogram is a metric unit of weight equivalent to 2.205 U.S. pounds.

Ketones — A family of organic compounds which are similar in their chemical and toxicological characteristics. Ketones are flammable, colorless liquids with pungent odors similar to acetone. Ketones are widely used in general purpose solvents.

—L—

L, l — Liter is a metric unit of capacity (volume) equivalent to 1.057 U.S. quarts.

Lacrimators — Chemical substances which irritate the eyes and cause tears to form (e.g., tear gas).

LC_{50} — Lethal Concentration 50 is the minimum concentration of a chemical that will kill 50% of a group of test animals. LC_{50} values may be expressed in units of parts per million or milligrams per cubic meter.

LC_{lo} — Lowest known lethal concentration.

LD_{50} — Lethal Dose 50 is the minimum amount (dose) of a chemical which will kill 50% of the experimental test animals when administered a single time. LD_{50} values are expressed with units of milligrams of chemical per kilogram of animal body weight. LD_{50} data typically indicates the type of animal and method of dose administration (e.g., Rat-Oral LD_{50} = 50 mg/kg).

LD_{lo} — Lowest known lethal dose.

LEL, lel or LFL, lfl — The lower explosive limit or lower flammable limit of a vapor or gas is the minimum percent concentration of the substance in air that will explode or produce a flash of fire when an ignition source is present. At concentrations below the LEL or LFL the substance is too lean to burn.

Local Exhaust Ventilation — A ventilation system designed to capture and exhaust contaminants from the air at the point where the contaminants are produced.

Lower Explosive Limit — See LEL.

Lower Flammable Limit — See LEL.

—M—

M, m — Meter is a metric unit of length equivalent to 39.37 inches.

M^2, m^2 — Square meter is a metric unit of area equivalent to 10.76 square feet.

M^3, m^3 — Cubic meter is a metric unit of volume equivalent to 35.315 cubic feet or 1,000 litres.

Melting Point — The temperature at which a solid chemical changes to a liquid.

Methyl Cellosolve — See glycol ethers.

Methyl Cellosolve Acetate — See glycol ethers.

mg/kg — Milligrams per kilogram is a metric unit often used to express toxicological dose.

mg/M^3, mg/cu. M
mg/m^3, mg/cu.m
Milligrams per cubic meter is a metric unit for expressing concentrations of dusts, gases or mists in air.

Miscible
Capable of being mixed or dissolved.

ml
Milliliter is a metric unit of volume equivalent to one cubic centimeter (i.e., 1/1,000 of a liter).

mm
Millimeter is a metric unit of length equivalent to 1/1,000 of a meter. It is occasionally used as a shorthand for mm Hg (see below).

mm Hg
Millimeters of mercury is a metric unit of pressure.

Molecular Formula
See formula.

Molecular Weight
See MW.

mppcf
Millions of particles per cubic foot is a rarely used unit for expressing concentrations of dust particles suspended in air.

Mutagen
A substance or agent capable of altering the genetic material in a living cell.

Mutagenic
Capable of causing or inducing a cellular mutation.

Mucous Membranes
Mucous secreting linings of respitatory, gastrointestinal and urinogenital passageways.

MW
Molecular weight indicates the relative weight of a chemical molecule. The molecular weight of a substance is the sum of the atomic weights of the atoms that constitute the molecule.

—N—

NaOH
Sodium hydroxide or caustic soda which is a strong base.

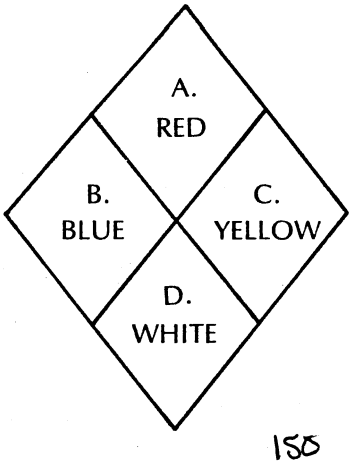
Narcosis
Unconsciousness or stupor produced by overexposure to certain chemicals.

NBUAC, or N-BuAc
Normal butyl acetate. See evaporation rate.

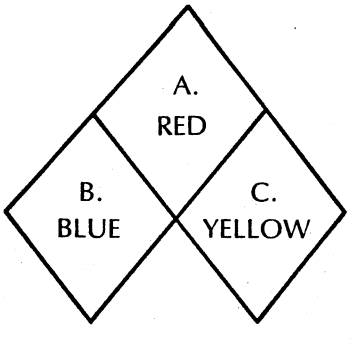
NFPA
National Fire Protection Association

NFPA 704
Standard System for the Identification of the Fire Hazards of Materials is a chemical labeling system developed by NFPA. The system uses standardized diamond shaped labels or placards to indicate the applicable hazards of labeled chemicals. Two sample NFPA 704 labels follow:

Sample Label 1



Sample Label 2



NFPA 704 labels typically consist of four quadrants that contain coded information concerning the fire, health, reactivity and special hazards of the product. Sample label 2 above only has three quadrants. This type of label is sometimes used when the product does not have any **special hazards** that would be listed in the fourth (special hazards) quadrant. The label quadrants have different background colors (as shown) which indicate the specific type of hazard covered by each of the quadrants (e.g., a quadrant with a blue background indicates health hazard information). The fire, health and reactivity quadrants use coded numbers from 0 to 4 that indicate the relative degree of potential hazard associated with the product. The larger the number, the greater the potential hazard. The special hazards quadrant uses three coded symbols to indicate any special hazards associated with the product. The letters (A. - D.) in the quadrants of the sample labels above are not NFPA standardized symbols. The letters only indicate the appropriate key for each quadrant. The keys for the four label quadrants follow:

A. **Fire Hazard Quadrant (Red Background)**

Number	***Hazard***
0	- Will not burn.
1	- Will only ignite if preheated.
2	- Will ignite if moderately heated or exposed to high ambient temperature.
3	- Will ignite under most ambient conditions.
4	- Will readily vaporize and burn at ambient conditions.

B. **Health Hazard Quadrant (Blue Background)**

Number	***Hazard***
0	- No hazard beyond that of ordinary combustible materials.
1	- Slightly hazardous irritants with comparatively minor effects.
2	- Hazardous with intense or continuous exposure.
3	- Extremely dangerous even with short-term exposures which may cause serious injury.
4	- Deadly, even with very short-term exposures.

C. **Reactivity Hazard Quadrant (Yellow Background)**

Number	***Hazard***
0	- Stable and not reactive with water under fire or ambient conditions.
1	- Mildly reactive with water and unstable if heated or subjected to elevated pressure.
2	- Normally unstable and may undergo violent chemical changes but does not detonate.
3	- Shock, heat or water contact may cause detonation or explosive decompression.
4	- Extremely unstable; capable of detonation or explosive decompression at ambient conditions.

D. **Special Hazards Quadrant (White Background)**

Symbol	***Hazard***
OX (OXY)	- Strong Oxidizer
	- Water Reactive
	- Radiation

Nephric Pertaining to the kidney.

Nephro- Pertaining to the kidney.

Nephron The basic structural and functional unit of the kidney.

Neuritis See neuropathy.

Neuron A nerve cell, the structural and functional unit of the nervous system.

Neuropathy Any dysfunction of the nervous system.

NIOSH National Institute for Occupational Safety and Health

NTP National Toxicology Program

—O—

Olfactory Pertaining to the sense of smell.

Oral Pertaining to the mouth or region of the mouth.

Oral Toxicity Adverse effects resulting from taking a substance into the body via the mouth.

Organic A chemical term indicating almost all compounds that contain one or more carbon atoms. Certain materials which contain carbon are not considered organic compounds. Some of these include certain oxides of carbon (e.g., carbon monoxide), graphite and carbide. Organic compounds comprise the vast majority of chemicals handled by newspaper employees.

ORL See oral.

OSHA Occupational Safety and Health Administration

Oxidation A type of chemical reaction with the potential to produce significant amounts of energy (e.g., the explosion of gunpowder). Controlled oxidation reactions are widely used in industry for chemical processing, adhesive materials and cleaning. Uncontrolled oxidation caused by a strong oxidizing agent can be very dangerous. Care should always be taken in handling and storage of any strong oxidizers. Oxidation reactions occur simultaneously with reduction reactions.

Oxidation-Reduction A major type of chemical reaction which involves the simultaneous oxidation and reduction of two or more substances. This type of reaction can result in significant amounts of heat and energy. Oxidation-Reduction reactions are sometimes called **REDOX** reactions.

Oxidizing Agents Chemicals which are readily reduced in the presence of reducing agents. Oxidizing agents either yield oxygen or gain electrons during an oxidation-reduction reaction.

—P—

PAH Polynuclear aromatic hydrocarbons are a group of chemicals that have two or more aromatic nuclei (i.e., six-member carbon rings). Naphthalene, Benz (a) pyrene, chrysene and anthracene are four examples of PAH compounds.

PEL — Permissible exposure limit is the legal exposure limit established by OSHA for regulated chemicals. PEL are published by OSHA in **29 CFR 1910.1000.** When exposures are maintained at or below the PELs, OSHA believes that nearly all workers may be repeatedly exposed day after day with no adverse effects. PELs are based on the best available information from industrial experience, experimental human and experimental animal studies.

Peripheral Neuritis — See peripheral neuropathy.

Peripheral Neuropathy — Dysfunction of the peripheral nerves (i.e., sensory, motor, reflex and vasomotor nerves).

Pensky-Martens — See PM.

Percent (%) Volatile — The percentage of a liquid or solid (by volume) that will vaporize or evaporate at a given temperature (typically 70°F). Certain chemicals like butane, gasoline and mineral spirits are 100% volatile. Other chemicals, such as paint, are only partially volatile (i.e., the paint thinner will evaporate but the pigment will not).

Petroleum Distillates — Various organic chemicals which result from refining (distillation) of crude oil (petroleum). All refined petroleum oils, fuels and many common solvents (e.g., Stoddard Solvent and mineral spirits) are petroleum distillates.

pH — A measure of chemical acidity or alkalinity. The pH scale goes from 1 (extremely acidic) to 14 (extremely caustic). Solutions like distilled water which are essentially neutral have a pH near 7. Chemicals which are not water soluble do not have a pH.

PM or PMCC — Pensky-Martens Closed Cup is one of several flash point test methods.

PNA — See PAH.

Poison, Class A — Term used for extrmely poisonous gases or liquids. These chemicals are so toxic that even small amounts mixed with air are potentially dangerous to life.

Poison, Class B — Term used for liquid, solid, paste or semi-solid substances which are potentially very toxic if they come in contact with the body.

Polymerization — A reaction in which small chemical molecules combine to form larger molecules (polymers). **Hazardous polymerization** is an uncontrolled reaction where polymer formation occurs rapidly and releases large amounts of energy.

Polyneuropathy — See peripheral neuropathy.

Polynuclear Aromatic Hydrocarbons — See PAH.

PPB, ppb — Parts per billion is a unit for expressing concentrations of gases and vapors in air. PPB indicates the number of molecules of gas or vapor contained in a billion molecules of air. PPB may also be used to express the concentration of a substance in a liquid or solid.

PPM, ppm — Parts per million is a unit used for expressing concentrations of gases and vapors in air. PPM indicates the number of molecules of gas or vapor contained in a million molecules of air. PPM may also be used to express the concentration of a substance in a liquid or solid.

psi, psia, psig — Pounds per square inch is a unit of pressure. For certain technical situations, pressure may be expressed in units of **psig** (pounds per square inch gauge) or **psia** (pounds per square inch absolute).

Pulmonary — Pertaining to the lungs.

—R—

Reaction — A chemical transformation or change involving the interaction of two or more chemicals to form one or more new substances (e.g., a reaction between hydrogen and oxygen produces water).

Reactivity — A measure of the tendency for a substance to undergo an uncontrolled chemical reaction with the release of energy. Undesirable effects including pressure buildup, temperature increase and the formation of noxious, toxic or corrosive by-products may occur in conjunction with an uncontrolled chemical reaction.

REDOX — See oxidation-reduction.

Reducing Agents — Chemicals which are readily oxidized in the presence of oxidizing agents. Reducing agents either combine with oxygen or lose electrons during an oxidation-reduction reaction.

Reduction — A type of chemical reaction which occurs simultaneously with oxidation.

Renal — Pertaining to the kidneys.

Respiratory System — The breathing system including the lungs, trachea (windpipe), larynx, mouth, nose and the associated portions of the nervous and circulatory systems.

RCRA — Resource Conservation and Recovery Act

—S—

Salts — Inorganic chemicals typically composed of two charged ions (groups of atoms). One ion has a positive charge and the other a negative charge. These ions tend to separate when dissolved in a liquid such as water. A simple example is sodium chloride (table salt) which is composed of positive sodium ions and negative chloride ions.

Sensitization — The process by which an individual is rendered sensitive to an allergen or chemical.

Sensitization Response — The uncontrolled, allergic like responses that occur when a sensitized individual is exposed to the sensitizing agent (i.e., sensitizer).

Sensitizer — A substance or event which induces sensitization or elicits a sensitization response (allergic reaction). The first exposure to a sensitizer typically causes little or no reaction. However, subsequent exposures may cause marked adverse responses which are not necessarily limited to the contact site.

SETA — Seatflash Closed Tester is one of several flash point test methods.

-Skin

A notation occasionally used in conjunction with PEL or TLV exposure standards to indicate that a chemical is readily absorbed by the skin, mucous membranes and eyes. This notation is used to identify the need for appropriate measures (i.e., gloves and eye protection) to prevent inadvertent skin or eye absorption of the chemical.

Skin Sensitizer

See Sensitizer.

Skin Toxicity

See Dermal Toxicity.

Solubility in Water

A term expressing the percentage of a material (by weight) that will dissolve in water at room temperature. Categories used to express varying degrees of solubility include:

Negligible	Less than 0.1% soluble
Slight	0.1 to 1.0% soluble
Moderate	1 to 10% soluble
Appreciable	Greater than 10% soluble
Complete	100% soluble

An alternative method of expressing solubility in water is sometimes used which indicates the number of milligrams (mg) of a material that will dissolve in a liter (l) of water (i.e., mg/l). Categories used to express varying degrees of solubility include:

Negligible	Less than 20 mg/l
Slight	20 to 200 mg/l
Moderate	200 to 1,000 mg/l
Appreciable	1,000 to 10,000 mg/l
Complete	Over 10,000 mg/l

Solvent

A liquid which will dissolve or disperse other substances.

Specific Gravity

The relative weight of a substance as compared to the weight of an equal volume of water. For a simple example, assume that a certain volume of a chemical weighs 8 pounds and an equal volume of water weighs 10 pounds. The chemical has a specific gravity of 0.8 (i.e., 8 divided by 10 equals 0.8). Insoluble materials with specific gravities less than 1.0 tend to float in a layer above water. Insoluble materials with specific gravities greater than 1.0 tend to sink and form a layer under water.

Stability

An expression of the tendency for a material to remain unchanged. A material is usually considered stable if it remains in the same form under typical conditions of use and storage.

STEL

Short term exposure limit is a term used by the ACGIH when referring to the airborne concentration of a substance to which workers can be exposed to continuously for a short period of time without suffering adverse health effects. A STEL is defined as a 15-minute time-weighted average exposure which should not be exceeded at any time during the work day even if the eight-hour time-weighted average is within the TLV. STEL exposures should not be longer than 15 minutes for a maximum of four such periods per day with at least 60 minutes between exposure periods. The STEL is designed to supplement the TLV-TWA where there are possible acute effects from a substance whose effects are mainly chronic.

STP

Standard temperature and pressure is 70°F (21°C) and 760 mm Hg.

Surfactants — Materials used to change the surface chemistry of liquids. A simple example illustrating the action of surfactants is the effect of detergents on water. Water and oil do not ordinarily interact with one another. However, when detergents are added to water the surface chemistry is changed and water is able to dissolve oil.

Synonym — An accepted name or expression which may be used as an alternative name for something. In chemistry, synonyms are additional names by which certain chemical compounds are known. For example, methyl alcohol is also known by the synonyms methanol and wood alcohol.

Systemic Toxicity — Adverse effects to the liver or kidneys resulting from overexposure to a chemical substance. May also refer to effects of a substance which is absorbed by an organ of the body independent of the site of entry.

—T—

TAG, Tag — See TCC and TOC.

Tagliabue — See TCC and TOC.

TCC — Tag (Tagliabue) Closed Cup is one of several flash point test methods.

TD_{lo} — The lowest dose of a substance known to produce any toxic effect.

Teratogen — A substance capable of causing damage to a developing embryo or fetus.

Teratogenic — Capable of causing or producing damage to a developing embryo or fetus.

TLV — A Threshold Limit Value is a recommended exposure standard established by ACGIH. The legal exposure standards applicable to newspapers are established by OSHA. However, TLVs are intended to be used as **guidelines** for good practices. When exposures are maintained at or below the TLVs, ACGIH believes that nearly all workers may be repeatedly exposed day after day with no adverse effects. TLVs are based on the best available information from industrial experience, experimental human studies and experimental animal studies. ACGIH establishes three types of TLVs including: TLV-Ceiling, TLV-STEL and TLV-TWA.

TLV-C — See ceiling.

TLV-Ceiling — See ceiling.

TLV-STEL — See STEL.

TLV-TWA — See TWA.

Tolerance — An increased ability to withstand irritating materials. Tolerance to many irritants develops over a period of time with repeat exposures.

TOC — Tag (Tagliabue) Open cup is one of several flash point test methods.

Toxic — Poisonous or pertaining to poisons.

Toxicity — The adverse effects resulting from overexposure to a toxic material.

Toxicology — The study of the harmful effects of toxic chemicals on living organisms.

Trade Name — The registered trademark name or commercial trade name for a material (e.g., VARSOL®).

TWA

Time-weighted average is an 8-hour exposure limit (TLV) established by ACGIH. TWA values correspond to OSHA Permissible Exposure Limits (PEL). TWA values are the most common type of TLV. When exposures are maintained at or below the TWA values, ACGIH believes that nearly all workers may be repeatedly exposed day after day with no adverse effects. TWAs are based on the best available information from industrial experience, experimental human studies and experimental animal studies.

—U—

UEL, uel or UFL, ufl

Upper explosive limit or upper flammable limit of a vapor or gas is the maximum percent concentration of the substance in air that will explode or produce a flash of fire when an ignition source is present. At concentrations above the UEL or UFL, insufficient oxygen exists to support combustion.

ug

Microgram is a metric unit of weight equivalent to 1/1,000,000 of a gram.

Unstable

Tending toward uncontrolled, violent decomposition or other unwanted chemical change during normal handling or storage.

—V—

Vapor Density

The relative weight of a given volume of vapor or gas when compared to the weight of an equal volume of air which is assigned a value of 1.0 (i.e., air = 1). Materials lighter than air have vapor densities less than 1.0. Materials heavier than air have vapor densities greater than 1.0. All vapors and gases will mix with air, but the lighter materials will tend to rise and dissipate. Heavier vapors and gases tend to sink and are likely to concentrate in low places or confined spaces.

Vapor Pressure

The pressure exerted by a saturated vapor above its own liquid in a closed container at a given temperature. The units of vapor pressure are usually mm Hg. Vapor pressure increases with increasing temperature.

Vascular

Pertaining to the blood vessels.

Vehicle

The liquid portion of paint or ink which is the carrier of the pigment. Oil is a common vehicle for paint and inks. Water is used as a vehicle for latex paint and water-based inks.

Ventilation

A system or equipment for circulating fresh air in and foul air out of an area.

Vesicants

Chemical substances which cause blistering.

Volatile

Chemicals which are readily vaporized or changed to a gas are known as volatile. These chemicals also tend to readily evaporate at comparatively low temperatures.

Hazardous Material Identification System (HMIS)

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM

The **Hazardous Material Identification System (HMIS)** was developed by the National Paint & Coatings Association (NPCA), a Washington D.C.-based trade association.[1] The Hazardous Material Identification System provides a uniform, comprehensive to inform employee of the hazards encountered in the performance of their jobs, and promotes the safe use of those hazardous substances.

HMIS labels and placards provide information on:

A. chemical identity - may be chemical or common name

B. degree of acute health, flammability and reactivity hazards - each label or placard contains three horizontal bars - blue for health, red for flammability, yellow for reactivity - each with its separate numerical coding

The degree of hazard for each catagory is expressed in a numerical rating, on a scale 0 to 4, with 0 denoting a minimal hazard, 4 a severe hazard. The 0-4 rating system is described as follows for each of the three types of hazards.

1. National Paint & Coatings Association,
   1500 Rhode Island Ave., N.E.
   Washington, DC 20018
   (202)462-6272

HEALTH HAZARD

4 – Deadly: even the slightest exposure to this substance would be life threatening. Only specialized protective clothing, for these materials, should be worn.

3 – Extreme Danger: serious injury would result form exposure to this substance. Do not expose any body surface to these materials. Full protective measures should be taken.

2 – Dangerous: exposure to this substance would be hazardous to health. Protective measures are indicated.

1 – Slight Hazard: irritation or minor injury would result from exposure to this substance. Protective measures are indicated.

0 – No hazard: exposure to this substance offers no significant risk to health.

FLAMMABILITY HAZARD

4 – Flash Point Below 73° F: this substance is very flammable, volatile, or explosive depending on its state. Extreme caution should be used in handling or storing of these materials.

3 – Flash Point Below 100° F: flammable, volatile or explosive under almost all normal temperature conditions. Exercise great caution in storage or handling of these materials.

2 – Flash Point Below 200° F: moderately heated conditions may ignite this substance. Caution procedures should be employed in handling.

1 - **Flash Point Above 200° F:** this substance must be preheated to ignite. Most combustible solids would be in this catagory.

0 - **Will Not Burn:** substances that will not burn.

REACTIVITY HAZARD

4 - **May Detonate:** substances that are readily capable of detonation or explosion at normal temperatures and pressures. Evacuate area if exposed to heat or fire.

3 - **Explosive:** substances that are readily capable of detonation or explosion by a strong initiating source, such as heat, shock or water. Monitor from behind explosion resistant barriers.

2 - **Unstable:** violent chemical changes are possible at normal or elevated temperatures and pressures. Potentially violent or explosive reaction may occur when mixed with water. Monitor from a safe distance.

1 - **Normally Stable:** substances that may become unstable at elevated temperatures and pressures or when mixed with water. Approach with caution.

0 - **Stable:** substances which will remain stable when exposed to heat, pressure or water.

The **HMIS** labels and placards also provide information on:

C. **proper personal protective equipment** - a white bar at the bottom of the label or placard contains a letter representing one or more personal protective devices that must be used when handling that substance. The following letter scheme is used:

A = Glasses

B = Glasses & Gloves

C = Glasses, Gloves & Synthetic Apron

D = Face Shield, Gloves & Synthetic Apron

E = Glasses, Gloves & Dust Respirator

F = Glasses, Gloves, Synthetic Apron & Dust Respirator

G = Glasses, Gloves & Vapor Respirator

H = Splash Goggles, Gloves, Synthetic Apron & Vapor Respirator

I = Glasses, Gloves & Dust/Vapor Respirator

J = Splash Goggles, Gloves, Synthetic Apron & Dust/Vapor Respirator

K = Air Line Hood, Gloves, Full Suit & Boots

X = Ask you supervisor for guidance

D. **chronic health hazards**

Original container labels should indicate target organs. Target organ information identified on the manufacturer's label as well as the MSDS should be resummarized on the HMIS label. The HMIS label is shown below in Figure 1.

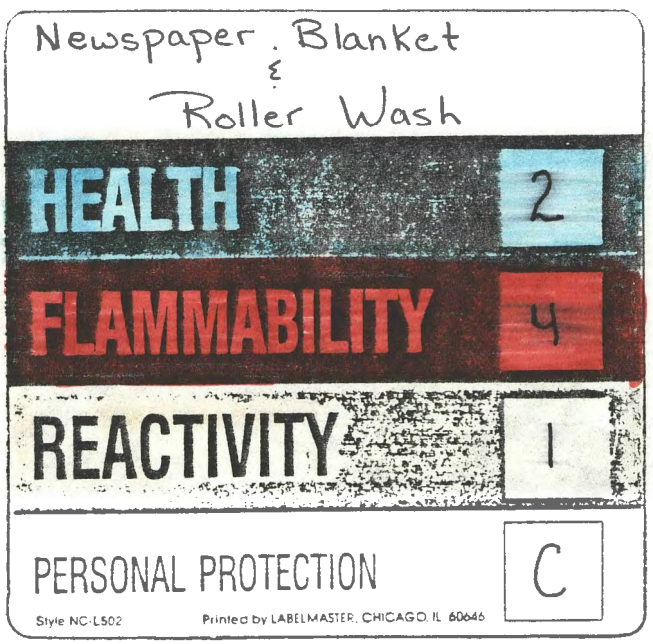


Figure 1. HMIS label

The above label is iterpreted as follows:

1. The chemical product name is **Newspaper Blanket & Roller Wash.**

2. The health rating of 2 means that exposure to the chemical is **Dangerous:** exposure to the substance would be hazardous to health.

3. The flammability rating of 4 indicates that the substance is **Highly Flammable:** the substance is volatile or explosive depending on its state, extreme caution should be used when handling.

4. The reactivity rating of 1 indicates that the substance is **Normally Stable:** substance may become unstable at elevated temperatures.

5. The personal protection rating indicates that **glasses, gloves** and a **synthetic apron** should be worn while handling the substance.

HMIS RATINGS FOR CHEMICAL PRODUCT LIST

DEPARTMENT: Photography Area

Chemical Product	Health	Flammability	Reactivity	Protection
Rapid Fixer Part A	1	1	0	-
Rapid Fixer Part B	2	0	0	B
SII Activator	2	0	0	B
SII Deactivator	1	1	1	-
Dektol Developer	1	0	0	B
Acufine Developer	1	0	0	B
R-76 Developer	1	0	0	Gloves
DD-2.5 Transfer Developer	1	0	0	A
Orbit Bath	1	0	0	-
Photo-Flo 200 Film Cleaner	1	0	0	-
Stabilization Process Cleaner	1	0	0	B

HMIS RATINGS FOR CHEMICAL PRODUCT LIST

DEPARTMENT: Composition Area

Chemical Product	Health	Flammability	Reactivity	Protection
RCD-5 Developer	1	0	0	A
RF-20 Rapid Fix	1	0	0	-
RFH Liquid Hardener	1	0	0	A
Sprayway Formula 40 Glass Cleaner	1	1	0	-

HMIS RATINGS FOR CHEMICAL PRODUCT LIST

DEPARTMENT: Press Area

Chemical Product	Health	Flammability	Reactivity	Protection
RF-20 Rapid Fix	1	0	0	-
RFH Liquid Hardener	1	0	0	A
GPP LD-40 Developer Part A	1	0	0	-
GPP LD-40 Developer Part B	1	0	0	A
R-30 Replenisher Part A	1	0	0	-
R-30 Replenisher Part B	1	0	0	A
Process Cleaner	2	1	0	C
Gum Arabic	1	0	1	A
NGS Plate Sensitizer	2	2	0	C
Black Bristle#7 Plate Developer	2	2	1	C
Newspaper Blanket & Roller Wash	2	4	1	C
Neutrofount	1	0	0	-
Lo Rub Black Ink	1	1	0	B
Colored Ink	1	1	0	B

HMIS RATINGS FOR CHEMICAL PRODUCT LIST

DEPARTMENT: Circulation Area

Chemical Product	Health	Flammability	Reactivity	Protection
Duplicator Fluid	1	4	0	C

Work Practices For Routine & Non-Routine Tasks

by operational area

WORK PRACTICES FOR ROUTINE & NON-ROUTINE TASKS

DEPARTMENT: Photography Area

35 MM Film Development

Routine Task - Solution Preparation

Orbit Bath

1. Put on the appropriate personal protection. Gloves are recommended.
2. Following the label directions, mix fresh orbit bath solution in the 1 gallon storage container.
3. Upon use, pour into the film container, avoiding contact with the eyes, then discard down the drain when finished.
4. Clean and/or dispose of the protection worn.
5. Wash hands upon completing the task.

Photo-Flo

1. Put on the appropriate personal protection. Goggles and gloves are recommended.
2. Following the label directions, mix fresh solution in the appropriate container. Avoid splashing the solution due to eye and skin irritation.
3. Discard the spent solution down the drain.
4. Clean and/or dispose of the protection worn.
5. Wash hands upon completing the task.

Fixer

1. Put on the appropriate personal protection. Goggles and gloves are recommended.
2. Following the label directions, mix fresh fixer in the appropriate container.
3. Upon use, pour solution into the film container avoiding splashes and spills.
4. After use in the film container, pour the solution back into the original storage container and reuse for 2 weeks.
5. Discard the spent solution down the drain.
6. Clean and/or dispose of the protection worn.
7. Wash hands upon completing the task.

D-76 Developer

1. Put on the appropriate personal protection. Gloves are recommended.
2. Following label directions, mix fresh developer in the appropriate container.
3. Upon use, pour into the film container avoiding splashing or spilling of the solution.
4. Discard down the drain after each use.
5. Clean and/or dispose of the protection worn.
6. Wash hands upon completing the task.

Acufine Developer

1. Put on the appropriate personal protection. Goggles and gloves are recommended.
2. Following the label directions, mix fresh developer in the appropriate container.
3. Upon use, pour into the film container avoiding splashing and spilling.
4. Discard down the drain after each use.
5. Clean and/or dispose of the protection worn.
6. Wash hands upon completing the task.

Ektamatic Processing

Routine Task - Solution Preparation

Activator & Deactivator

1. Put on the appropriate personal protection. Goggles and gloves are recommended.
2. Pour the ready to use solutions into their appropriate plastic quart bottles. Use caution when pouring the two solutions near each other. They are highly reactive.
3. Place each quart bottle on the processor using caution not to mix solutions. Wipe up any spills made in between transfer of the activator and deactivator to the processer.
6. Clean and/or dispose of the protection worn.
7. Wash hands upon completing the task.

Process Cleaner

1. Put on the appropriate personal protection. Goggles and gloves are recommended.
2. Pour the ready-to-use solution into the processor once all other solutions have been removed.
3. Let the processor run for the appropriate amount of time.
4. Discard the process cleaner down the drain when finished.
5. Clean and/or dispose of the protection worn.
6. Wash hands upon completing the task.

Non-Routine Task - Discarding Solutions

Activator & Deactivator

1. Put on the appropriate personal protection. Goggles and gloves are recommended.
2. Upon discarding the spent solutions, use extreme caution not to mix the activator and deactivator.
3. Pour the activator down the drain first. Flush the drain with large amounts of water.
4. Pour the deactivator down the drain last. Flush the drain with large amounts of water.
5. Clean and/or dispose of the protection worn.
6. Wash hands upon completing the task.

Tray Development

Routine Task - Solution Preparation

Dektol Developer

1. Put on the appropriate personal protection. Goggles and gloves are recommended.
2. Following the label directions, mix fresh developer in the appropriate container.
3. Upon use, pour the solution into the developing tray and discard when the solution is exhausted. Avoid splashing due to eye and skin irritation.
4. Clean and/or dispose of the protection worn.
5. Wash hands upon completing the task.

PMT Processing

Routine Task - Solution Preparation

1. Put on the appropriate personal protection. Goggles and gloves are recommended.
2. Upon use, pour the ready-to-use solution into the process tray and discard when the solution is exhausted.
3. Clean and/or dispose of the protection worn.
4. Wash hands upon completing the task.

WORK PRACTICES FOR ROUTINE & NON-ROUTINE TASKS

DEPARTMENT: Composition Area

Composition Processor For Typeset

Routine Tasks - Changing the Solutions

1. Put on the appropriate personal protection. Goggles and gloves are recommended.
2. Drain the developer into the portable plastic developer container beneath the processor. The spent developer is then disposed of down the drain in the sink in the janitor's closet.
3. Drain the fixer into the portable plastic fix container beneath the processor. The spent fixer is then disposed of down the drain in the sink in the janitor's closet.
4. Rinse both containers after spent solutions are disposed of.
5. Following the label directions, mix fresh fix solution in the portable plastic fix container. Be careful to avoid splashing of the RF-20 fix solution and RFH liquid hardener. Irritation will occur if contact is made with the eyes or skin.
6. Following the label directions, mix fresh developer in the portable plastic developer container. Be careful to avoid splashing on the skin or in the eyes.

7. Pour the fresh fixer into the appropriate processor tray first. Wipe up any spills outside of the fixer tray so as to not contaminate the fresh developer.
8. Pour the fresh developer into the appropriate processor tray.
9. Relocate the portable plastic containers back beneath the processor.
10. Clean and/or dispose of the protection worn.
11. Wash hands upon completing the task.

Non-Routine Task - Repair of the Processor

Wet Plenum

1. Put on the appropriate personal protection. Gloves are required.
2. Remove the roller mechanism, allowing existing developer and fixer to drain back into the solution tanks.
3. Immediately rinse the roller mechanism in clean water, taking precaution not to contact the eyes or skin with the chemicals on the roller.
4. Perform the necessary repair and reinstall the roller mechanism in its original working position.
5. Clean up all spills on or near the processor.
6. Clean and/or dispose of the protection worn.
7. Wash hands upon completing the task.

Dry Plenum & Drive Mechanism

1. Use caution to avoid contact with the chemical solutions.

WORK PRACTICES FOR ROUTINE & NON-ROUTINE TASKS

DEPARTMENT: Press Area

NO SMOKING IN THE PRESS ROOM OR PLATE MAKING AREA

Lith Processor

Routine Tasks - Changing the Solutions Twice Per Week

1. Put on the appropriate personal protection. Goggles and gloves are recommended.
2. Following the label directions, mix fresh replenisher using Parts A & B in the replenishment container. Use caution not to splash the solution while mixing due to possible irritation to the skin and eyes.
3. Following the label directions, mix fresh fix and hardener in the replenishment container. Use caution not to splash.
4. Relocate both replenishment containers back into their working positions.
5. Clean and/or dispose of the protection worn.
5. Wash hands upon completing the task.

Non-Routine Task - Cleaning the Lith Processor

1. Put on the appropriate personal protection. Goggles, gloves and an apron are recommended, especially due to the nature of the process cleaner.
2. Drain the chemical tanks by opening the valves.
3. Fill the tanks with water and add processor cleaner. Use an extreme amount of caution to avoid eye and skin contact with the process cleaner.
4. Run the processor for 24 hours.
5. Drain the chemical tanks by opening the valves.
6. Following the label directions, mix fresh developer in the now empty replenishment container.
7. Using a chemical beaker, remove the necessary quantity of the developer and pour it into the appropriate chemical tank. Use caution to avoid spills.
8. Pour the excess developer down the drain.
9. Following the label directions, mix fresh fix to go into the chemical tank. Use a chemical beaker to transfer the fixer to the tank.
10. Follow the directions above for the routine task of replenishing the replenisher and fix solutions that go in the portable containers beside the processor.

Plate Making

Routine Task - Sensitizing Plates

1. NO SMOKING IS ALLOWED!
2. Put on the appropriate personal protection. Goggles, gloves and an apron are recommended.
3. Turn on the ventilation fan in the area.
4. While sensitizing the plates, use caution to avoid eye and skin contact with the solution.
5. Clean and/or dispose of the protection worn.
6. Wash hands upon completing the task.

Routine Task - Plate Processing

1. NO SMOKING IS ALLOWED!
2. Put on the appropriate personal protection. Goggles, gloves and an apron are recommended.
3. Use caution when adding the developer to the sponge in the plate processor. Avoid eye and skin contact with the developer and make sure there are no flame sources near the developer.
4. Use caution when adding gum arabic to the second sponge in the plate processor.
5. Clean and/or dispose of the protection worn.
6. Wash hands upon completing the tasks.

Press

Routine Task - Blanket Cleaning

1. NO SMOKING IS ALLOWED!
2. Put on the appropriate personal protection. Goggles, gloves and an apron are recommended.
3. Use the red printers rags to clean the blankets.
4. Pump an adequate amount of cleaning solvent from the portable solvent container that is located near the sink in the press room onto the cleaning rags.
5. Upon cleaning the blanket, containerize the red printer's rags in the designated container.
6. Clean or dispose of the protection worn.
7. Wash hands upon completing the task.

Routine Task - Neutrofount Transfer

1. NO SMOKING IS ALLOWED!
2. Put on the appropriate personal protection. Gloves are recommended.
3. Following the label directions, mix fresh neutrofount solution in the Baldwin fountain mixing container.
4. Relocate the container back into its working position.
5. Clean and/or dispose of the protection worn.
6. Wash hands upon completing the task.

Routine Task - Ink Transfer

1. NO SMOKING IS ALLOWED!
2. Put on the appropriate personal protection. Goggles and gloves are recommended.
3. Pump the ink into the ink fountains using caution to avoid eye and skin contact with the ink.
4. Clean and/or dispose of the protection worn.
5. Wash hands upon completing the task.

Non-Routine Task - Transfer of Blanket Wash

1. NO SMOKING IS ALLOWED!
2. Put on the appropriate personal protection. Goggles, gloves and an apron are recommended.
3. Use caution when transferring the blanket wash into the intermediate container from the original container. Avoid eye and skin contact with the solvent.
4. Clean and/or dispose of the protection worn.
5. Wash hands upon completing the task.

Non-Routine Task - Cleaning Press Parts

1. NO SMOKING IS ALLOWED!
2. Put on the appropriate personal protection. Goggles, gloves and an apron are recommended.
3. Pour an adequate amount of cleaning solvent into an appropriate tray. Use caution not the splash the solvent on the skin or into the eyes.
4. Upon cleaning the necessary parts, containerize the spent solvent in the designated container.
5. Clean and/or dispose of the protection worn.
6. Wash hands upon completing the task.

WORK PRACTICES FOR ROUTINE & NON-ROUTINE TASKS

DEPARTMENT: Circulation Area

Duplicator Machine

Routine Task - Adding Duplicator Fluid

1. NO SMOKING IS ALLOWED!
2. Put on the appropriate personal protection. Gloves are recommended.
3. Pour the duplicator fluid into the designated tray. Use caution not to splash on the skin or into the eyes.
4. Clean and/or dispose of the protection worn.
5. Wash hands upon completing the task.

Emergency Procedures

EMERGENCY PROCEDURES

IN CASE OF A FIRE

1. EVACUATE THE BUILDING IMMEDIATELY - DO NOT ATTEMPT TO CONTAIN OR MINIMIZE THE FLAME.
2. Evacuate the building through designated exits that are farthest way from the fire.
3. DO NOT attempt to gather any materials from the facility.
4. Call the fire department IMMEDIATELY
5. Inform the fire department of the nature of the fire and the source of the fire if known.

IN CASE OF A CHEMICAL SPILL

Spills Containing Blanket Wash

1. Evacuate unnecessary personnel.
2. Put on the appropriate personal protection before attempting to contain and remove the spill.
2. Put out or shut off any/all sources of flame. Turn off any unnecessary electrical equipment.
3. NO SMOKING ALLOWED WHEN WORKING AROUND OR NEAR BLANKET WASH.
4. Notify the fire department when fire or explosion hazards are possible.
5. Open the area up to provide adequate ventilation, turning on ceiling fans.
6. For small spills, remove the source of the spill, wipe up with blanket wash rags and then containerize the rags when finished.
6. For large spills, remove the source of the spill, call the fire department. If approved by the fire department, flush the area with water.

Spills Containing Ink

1. Put on the appropriate personal protection.
2. Put out or shut off any/all near by sources of flame.
3. Open the area up to provide adequate ventilation.
4. Collect large spills with a shovel, using dry sand and/or an absorbent material to absorb the ink.
5. Clean the spill area with detergent solutions.

IN CASE OF A CHEMICAL SPILL

Spills Containing Photographic Chemicals & Plate Developing Solutions

1. Put on the appropriate personal protection.
2. Consult the Material Safety Data Sheets for special spill or leak procedures pertaining to the chemical involved in the spill.
3. Open the area up to provide adequate ventilation, turning on ceiling fans.
4. Remove the source of the spill.
5. Unless special procedures are outlined for the particular chemical, mop up or use the wet vacuum and then dispose of down the drain.
6. Use caution not to combine reactive chemicals when cleaning up spills.

APPENDIX B

Bozeman Daily Chronicle's Employer Information

Special Compliance Forms

LETTER REQUESTING MSDS

Dear Sir/Madam:

As a part of our efforts to comply with OSHA Hazard Communication Standard, I would like to request Material Safety Data Sheets (MSDS) for those products currently being purchased from you company. The following is a list of conditions of purchase that we are implementing with all of our chemical suppliers in an effort to achieve efficient compliance:

* MSDS are to be as complete as is technically feasible;

* Any trade secret claims must be clearly stated on MSDS;

* Trade secret products must have 24-hour emergency phone numbers available on the MSDS;

* Any product supplied to use thais is non-hazardous and/or not covered by an MSDS, must be accompanied by a letter indicating that the product is not covered by the OSHA Communication Standard; and,

* When MSDS are updated to incorporate new information or a new product formulation, please provide new MSDS as soon as possible.

As you realize, the above provisions are requirements of the federal Hazard Communication Standard which was effective November 25, 1985 for chemical manufacturers and distributors. I appreciate your company's cooperation and assistance with this undertaking.

Attached is a list of the products we purchase from your company and require MSDS, or an appropriate letter, for each product.

Again, I appreciate your cooperation and look forward to continued business with your company.

Sincerely,

EMPLOYEE INFORMATION REQUEST FORM

Please Print:

1. Name _____ 2. Work Location _____

3. Job Title _____ 4. Phone Number _____

5. Supervisor _____

Describe briefly the substance you are exposed to or are requesting further information on concerning the health and safety hazards of this substance in the workplace:

1. Trade Name _____

2. Chemical Name or Ingredients (If known) _____

_____

3. Manufacturer (Name and Address, If known) _____

_____

_____

4. Does the substance have a label? ____Yes ____No

5. Physical form of the substance: ___Gas ___Liquid ___Solid

___Dust _____Other

6. Any other information which will identify the substance (the circumstance of exposure, other characteristics of the substance, etc.).

_____

_____

7. If you have specific questions, write them below.

_____

_____

_____

Received by:

Signature: _____ Employee Representative_____

Date: _____ Date_____

EMPLOYEE REQUEST:

MATERIAL SAFETY DATA SHEET

_____

EMPLOYEE'S NAME REQUEST DATE

_____

EMPLOYEE'S REPRESENTATIVE TITLE

_____

EMPLOYEE'S TITLE DEPARTMENT

_____

THE SUBSTANCE OR SUBSTANCES
FOR WHICH I REQUEST A COPY OF
THE MATERIAL SAFETY DATA SHEET
IS (ARE):

_____

_____

_____

_____

_____

_____

EMPLOYEE SIGNATURE REPRESENTATIVE'S SIGNATURE

_____

Request Status

Requested Copy(s) Received_____ Date_____
(signature)

Requested Copy(s) Unavailable_____ Date_____
(signature)

The unavailable copy(s) of the Material Safety Data Sheet(s) have been requested from, and will be furnished by, the supplier.

_____ Date_____
(compliance officer)

RIGHT TO KNOW TRAINING LOG

COMPANY SUBJECT

TRAINING OFFICER DATE OF TRAINING

EMPLOYEE NAME	DEPARTMENT	EMPLOYEE SIGNATURE

CONTRACTOR ACKNOWLEDGEMENT LOG

All contractors working for the Bozeman Daily Chronicle must sign this acknowledgement log prior to starting their contracted work duties, if their duties require them to work around or be exposed to any of the hazardous chemicals listed for use in any of the Bozeman Daily Chronicle's four operational areas. A contractor signature indicates that the contractor has read and fully understands the information listed in the employee information binder.

CONTRACTOR NAME	REPRESENTATIVE	SIGNATURE	DATE

Employee Training Outline

EMPLOYEE TRAINING

Preliminary Training

Federal & State Safety and Health Acts

On November 25, 1985 two laws became effective in order to help ensure the safety and good health of workers. The **Hazard Communication Standard** was adopted by the federal Occupational Safety and Health Administration (OSHA) and the **Employee and Community Hazardous Chemical Information Act** was passed by the state of Montana. Both laws are intended to enhance worker and community safety by requiring all employers to make information available on all chemicals and their associated hazards in the workplace. These laws establish procedures for the employer to follow so that they provide a full coverage of information on hazardous workplace chemicals.

Both laws are intended to help protect workers' health although there are several policy areas that differ between the two laws. The Montana law follows OSHA's federal standard with the exceptions of area coverage and community access to information. The OSHA standard applies only to workers in 20 standard industrial classifications. Printers are covered under the standard industrial classification (SIC) code of #27. The Montana law covers all workers who may be exposed to hazardous chemicals in their areas of work. The Montana law also addresses the issue of community safety. Under this law, the community has access to information regarding the hazardous chemicals used in the community. There is one major difference in the formal require-

ments of the two laws. OSHA's standard requires that a written hazardous communication program be developed to ensure the dissemination and explanation of chemical information while Montana's law does not.

In adhering to both federal and state laws, the following requirements are met by The Bozeman Daily Chronicle:

1. A written hazardous communication program is developed for employee access;
2. Material Safety Data Sheets are obtained from the manufacturers of all chemicals used in the workplace;
3. A complete chemical list is developed from the Material Safety Data Sheets that are obtained, covering all chemicals used in the workplace;
4. Work practices for routine and non-routine tasks involving the use of hazardous chemicals are developed for employee access;
5. Emergency procedures for fire and unforeseeable chemical disasters are developed for employee access;
6. Community Right-To-Know information is supplied to the clerk and recorder of Gallatin county for public access; and
7. Employee training sessions are given for all employees that work around or may be exposed to hazardous chemicals in the workplace.

Employee Rights

All employees that work around or with hazardous chemicals are covered by one or the other of the two laws previously mentioned. It is the responsibility of the employer to provide chemical information to the employees. All workers have the right to access the workplace chemical list and the material safety data sheets. No worker can be forced to work with a hazardous chemical if the employer does not have an MSDS for the particular chemical within 5 working days of the worker's request. This provision is covered by state law.

All workers have the right to hazardous chemical training on the potential hazards of and safe work practices for workplace chemicals. Personal protection in the way of goggles, gloves, aprons, respirators, etc. must be supplied to the workers for their safety and health protection.

Any worker has the right to file a written complaint to the local health officer or the county attorney if he/she feels that the employer is not adhering to the provisions of either the federal or state laws. If the complaint is chosen to be acted upon, an investigation of the complaint must take place within 5 working days of the initial filing of the complaint. Within 10 days of the initial filing, a complete report that details the findings of the investigation must be completed. The employer must be notified of any violation that the investigating official determines as valid. The employer has 10 working days to take corrective action before prosecution can occur. The employer may

not fire, demote, discipline or discriminate against any employee who files a complaint.

The Production Manager has on file specific forms for employees to complete when they request further chemical information. Forms are available to request MSDS as well as chemical exposure information.

Methods of Implementation

The Bozeman Daily Chronicle uses a number of methods to help implement the federal and state health and safety laws. Both written and verbal information concerning hazards and safe work practices are provided to all employees working around or with hazardous chemicals.

A written hazard communication program is available to all employees through the Production Manager or by way of the employee information binders that are located throughout the workplace. The written communication program develops the procedures that must be followed in order that the employers provide adequate chemical information to all employees. The program outlines the following areas;

1. All of the program records used in order to comply with federal and state laws;
2. Employee training and educational materials;
3. Container labeling and area placarding; and
4. Contractor notification.

Chemical lists and material safety data sheets are provide in the employee information binders in order for the employees to have an understanding of chemical types, names and specific details on chemical hazards. The details and format of the chemical lists and MSDS are discussed in detail later.

Container labeling and area placarding are used as a means of informing the worker of chemical identities as well as hazards and safe work practices. All containers should be properly labeled so as to provide the reader with information concerning chemical identity and health and/or physical hazards. Area placarding provides the worker with a general idea of the degree of hazard that is presented to him/her by chemicals present in the area. Labeling requirements and the area placarding system are defined in the employee information binders and will be discussed in detail later.

Employee training is provided to all employees working around or with hazardous chemicals in the workplace. The hazardous chemical training is meant to inform the worker on the following areas:

1. Methods and observations that may be used to detect the presence or release of hazardous chemicals in the workplace;
2. The physical and health hazards of the chemicals in the workplace;

3. Protective measures that an employee can take to help eliminate or reduce exposure to hazardous chemicals, including work practices, personal protection and emergency procedures; and
4. The details of the hazard communication program as developed by the employer, including information access, Material Safety Data Sheet interpretation, and a labeling and area placarding system description.

Work practice guidelines and emergency procedures are developed for employee access in the information binders. These guidelines and procedures are designed to help ensure reduced chemical exposure and increased worker safety.

Primary Training

Introduction To The Chemical List & MSDS

** At this point it is time to introduce the employee to the chemical list that covers their operational area of work. **

The chemical list is compiled according to product type, chemical product, and the manufacturer's name, address and telephone number. The chemical product name cross-references to the chemical name on the MSDS.

** Now introduce the MSDS - all the MSDS for the chemicals on the list need not be introduced. Rather, pick several of the MSDS to explain and interpret. Use the MSDS interpretation guide to detail the contents of the MSDS. **

Introduction To The Label & Placard System

** Now introduce the Hazardous Material Identification System (HMIS) as outlined in the employee information binder. Show the employees an example of what the label looks like as well as the information represented on the label. Have the HMIS ratings for the chemical list, as outlined in the employee information binder, and explain how the rating for several chemicals were obtained. **

** Now explain the requirements of container labeling. Have a chemical container on hand to demonstrate labeling information. **

The purpose of the label is to provide visual warning about the hazards of the chemical in the container. Container labeling must indicate the product name as it appears on the MSDS. Original container labels must also state the hazardous chemical ingredients, the appropriate warning, and the name and address of the manufacturer. Container labels should indicate specific target organs that may be affected by exposure to the hazardous chemical. Any container that is not properly labeled should be noted to the Production Manager in order for him/her to replace the original label with a HMIS label.

Hazards Of The Workplace Chemicals

** At this time the hazards of workplace chemicals should be explained. **

A chemical is defined as toxic or hazardous if it has the capacity to produce personal injury or illness to man through ingestion, inhalation, or absorption through any body surface. The hazardous chemical can exist as a solid, a liquid, or a gas. One must be aware that a chemical, in one state, may be harmless but upon changing to another state it becomes life-threatening.

A chemical may impose physical and health hazards to an individual. A chemical is given a health hazard rating if there is statistically significant evidence based on at least one study that acute or chronic health effects may occur upon exposure. The types of health hazards are:

1. acutely toxic
2. chronically toxic
3. carcinogenic
4. mutagenic
5. teratogenic
6. sensitizing agent

A chemical is given a physical hazard rating if there is valid evidence that it is a combustible liquid, compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric or reactive. The types of hazards are:

1. corrosive
2. irritant
3. reactive
4. oxidizers
5. flammable/combustible
6. explosive

** One should have a working knowledge of the definitions of the various types of health and physical hazards so that the pertinent terms can be defined. **

** Routes of entry of the hazardous chemical should be explained. **

There are three main or common ways in which hazardous chemicals can enter the human body. They are skin contact, ingestion and inhalation. Liquids and powder chemicals can get on the skin by accidentally spilling or through a job process. Particular chemicals will cause the skin to burn or become irritated. Other chemicals can penetrate the skin and cause internal damage. Chemicals can also be swallowed or introduced into the body by way of one's fingers. Lastly, toxic dust and vapors can be taking in by merely breathing. This route of entry is difficult to control because a worker may not know that he/she is

inhaling a hazardous substance. Particular precautions should be taken such as practicing good oral hygiene, following label directions and following safe work practices in order to ensure the elimination of hazardous substances entering the body.

** Refer to the HMIS ratings for the chemical list and explain the hazard ratings for each rating combination present on the rating sheet. **

Measure of Prevention & Protection

** At this time introduce the work practices for routine and non-routine tasks that require the use of hazardous chemicals. The entire set of practices need not be gone over rather explain the general requirements of following label directions, using good oral hygiene and referring to the MSDS for special handling requirements for specific chemicals. Stress the importance of being fully aware of the characteristics and directions that accompany any chemical. **

** Also introduce the employees to the various means of personal protection that are available to each employee for use with chemical handling and exposure. Once again refer to the HMIS ratings for the chemical list and explain the various personal protection recommendations that accompany the use of certain chemicals. Use the HMIS marking system information that is included in the information binder to explain the protection combinations. **

Chemical Detection

Workers should be aware of methods to help detect the presence of a hazardous chemical. If an employee encounters an odd or strong odor in any operational area, he/she should notify the Production Manager before attempting to contain or clean up a possible spill or leak. Any employee encountering an odd oder MUST NOT attempt to test smell the possible leak or spill. Upon determination of a chemical presence, personal protection should be put on before attemping to correct the problem. Visual observation of a released chemical should also prompt any employee to first contact the Production Manager. Upon determining the source of the release, take the necessary precautions to contain or minimize the release. If any doubt remains as to the type or nature of a chemical release, contact the fire department.

Emergency Procedures

** At this time, go over the emergency procedures in detail. Explain the importance of worker safety. **

Closing Comments

** Before the employees are dismissed from the training session, make sure that all of their questions have either been addressed or have been noted for further investigation. If research needs to be done on various topics and questions, be sure that within a reasonable amount of time the inquiring employee gets a response. If no further questions are asked, proceed to have each employee sign the employee training log acknowledging their understanding of the information just released to them. It is suggested that a brief 6 or so question written test be administered to each employee as a record of their understanding of the chemical information just discussed. The written test could prove very useful in the case of an inspection by either federal or state investigators. **

END OF TRAINING SESSION

Community Right-To-Know Requirements

COMMUNITY RIGHT-TO-KNOW REQUIREMENTS

Montana's Employee and Community Hazardous Chemical Information Act requires **The Bozeman Daily Chronicle** to submit the following information to the clerk and recorder of Gallatin county for recording:

a) a copy of the most current Material Safety Data Sheet for each hazardous chemical in the workplace;

The Right-To-Know Law requires that The Bozeman Daily Chronicle must certify each MSDS that is received with a chemical shipment. A sample certification form for Material Safety Data Sheets is shown in Figure 1 of this section. Any form or method can be used to certify the MSDS as long as the certification is legible and contains all the necessary certification information. Once an MSDS for a specific chemical has been recorded in Gallatin county, other employers need not record the MSDS for that chemical, even if it is used in the workplace. The exception to this "one recording" rule would occur if a revised or up-dated MSDS is prepared and shipped with that chemical at a later date.

S A M P L E

Certification for Material Safety Data Sheet

STATE OF MONTANA)
) ss:
County of _____)

I hereby certify that this is a true and exact copy of the MSDS provided by the manufacturer of the chemical named on this sheet and that this chemical is present in the workplace of

_____ (employer's name) _____ located at

_____ (address of workplace) _____ in

_____ (city/town) _____.

_____
Signature of Employer's Representative

Subscribed and sworn to before me this _____ day of

_____, 19 _____

_____
Notary Public for the State of Montana

Residing at _____

Seal My Commission Expires _____

Figure 1. Sample MSDS Certification

b) an acknowledged copy of each new annual workplace chemical list; and

The list must contain the following information for each hazardous chemical present in the workplace:

* The chemical name of each chemical present;
* All generally used common names of each chemical, cross-referenced to the chemical name;
* The work area in which each chemical is normally stored or used.

The Bozeman Daily Chronicle must prepare, update and record this list at least once a year.

c) a list acknowledged by the employer of the names or titles and telephone numbers of knowledgeable representatives of the employer or the chemical manufacturer who can be contacted for further information or in case of an emergency.

At the present time there is a $5.00 filing fee with the Gallatin county clerk and recorder for each page of information that is recorded. The county clerk must index the recorded information by workplace name; all entries for a workplace must be grouped together in the index. The clerk must separately index all of the chemicals for which material safety data sheets have been recorded.

All information recorded by the county clerk is public information and available for inspection during normal working hours. The local fire chief(s) are required to inspect all information maintained by the county clerk and recorder on workplace hazardous chemicals. The local fire chief must be permitted onsite inspection of hazardous chemicals in any workplace for the purposes of planning fire department activities or in case of an emergency. As a result of an inspection, the local fire chief may note and report, for possible action by the county attorney or other appropriate law enforcement officials, any violation by an employer of a provision of the Montana Employee and Community Hazardous Chemical Information Act or any other law pertaining to hazardous chemicals or fire safety.

U.S. Environmental Protection Agency Requirements

U.S.ENVIRONMENTAL PROTECTION AGENCY REQUIREMENTS

Waste management is controlled on the federal level by the EPA. The Bozeman Daily Chronicle does generate liquid and solid wastes and therefore regulations enforced by the EPA must be adhered to. Most of the solid wastes are consumed in process but some liquid waste is generated. Liquid wastes presently being generated by The Bozeman Daily Chronicle include photographic chemicals and plate processing solutions. At the present time all these wastes literally go down the drain. Solid wastes being generated include minimal amount of waste ink, lubricating oils, spent cleaning solvent and paper cleaning towels filled with waste ink and cleaning solvent.

The EPA has not established federal regulations covering disposal of the liquid wastes (effluent) typically produced by newspapers with the exception of photographic processing wastes. Subchapter N of EPA Standard 40 CFR (Part 459) establishes effluent guidelines and standards for photographic processing point sources. Hazardous waste lists covering waste generation from specific and non-specific sources, which appear in 40 CFR Part 261.31 and Part 261.32 do not indicates regulation of photographic or plate processing wastes. In order for 40 CFR Part 459 to be applicable to effluent control, a photographic processor must process more than 150 sq. meters (1,600 sq. feet) of photographic material per day. As indicated by the figures listed under "Photographic Process Quantity", included at the end of

this information section, The Bozeman Daily Chronicle does not process more than 1,600 sq. ft of photographic material per day. Subchapter N of 40 CFR (Part 401) indicates that the effluent guidelines and standards are written in accordance with the Federal Water Pollution Control Act. To the best of my judgment it appears that all of the Bozeman Daily Chronicle's liquid photographic waste is exempt from EPA hazardous waste storage, treatment and disposal regulations. There are a number of federal regulations other than The Clean Water Act that must be checked.

At the end of this information section on EPA requirements, a summary of The Bozeman Daily Chronicle's generator status is included. Of the approximate 470 kilograms of liquid waste that is generated monthly, almost the entire amount is due to spent photographic chemicals. The Bozeman Daily Chronicle would then fall below the "small generator" status due to generation of plate processing liquid waste, spent cleaning solvents and waste ink.

Bozeman has pretreatment and treatment guidelines for wastes being introduced into the local sewer system. At the present time, the city of Bozeman follows the federal hazardous waste guidelines with additional attention to 6 heavy metals. Cadnium, chromium, lead, zinc, copper and platinum are the only waste constituents that are tightly controlled. At the present time the city of Bozeman does not have parts per million limits on waste constituents introduced into the sewer system. It appears that the Bozeman Daily Chronicle's disposal of photographic and plate

processing wastes is in accordance with city regulations.

The Bozeman Daily Chronicle's disposal of waste ink, spent solvents and used cleaning rags must be in accordance with EPA regulations. Waste ink is negligeable leaving the spent solvent and used cleaning rags to be containerized for proper disposal. The blanket wash contains acetone and therefore a compatible container must be used for disposal of the waste. The original solvent container should be examined and a container of compatible material and construction type should be used to accumulate and dispose of the waste solvent. It is not recommended that the waste solvent be accumulated in its respective container for more than 90 days before it is properly disposed. The container must be properly labeled during accumulation as well as properly labeled for transport during disposal. Due to The Bozeman Daily Chronicle's generator status, proper disposal of the spent solvent includes disposal to the city landfill if the waste product is accepted by them. Otherwise, a hazardous waste disposal facility must be located and used.

The waste rags used for press cleaning must also be disposed of properly. It is recommended that The Bozeman Daily Chronicle thoroughly understand the services of the rag cleaning facility in order to determine where the liability for the hazardous material contained in the rags does fall. If the liability does fall on The Bozeman Daily Chronicle, extra precautions should be taken to ensure safe handling and transport of the rags to the cleaning facility.

Ink that is stored for reuse is not covered under EPA regulations due to the fact that the ink is not a waste product at this point in the printing process. Reusable ink should be stored in containers similar to the containers of original shipment. The storage containers must then be labeled to comply with OSHA.

Further information concerning the generation, storage, treatment and disposal of EPA regulated hazardous waste can be found in The Code Of Federal Regulations (40 & 49). The code books can be found in the Montana State University library on the second floor.

CHEMICAL LIST
&
GENERATOR STATUS DETERMINATION

Figures are in gallons/month unless otherwise specified.

	USE	DISPOSAL
PRESS ROOM		
Varn Products-Gum Arabic	1	0
Anchor/Lithkemco-NGS Plate Sensitizer	1	.5
Anchor/Lithkemco-#7 Plate Developer	2	1
Hurst-Blanket Wash	13	1
Alta Chem-RF-20 Rapid Fix	20	20
Alta Chem-RFH Liquid Hardner	1	1
General Photo-GPP LD-40 Developer Part A	.416	.416
General Photo-GPP LD-40 Developer Part B	.416	.416
Alta Chem-R-30 Replenisher Part A	20	20
Alta Chem-R-30 Replenisher Part B	20	20
Kodak-Process Cleaner	1/6 qt	1/6 qt
NDI-Neutrofount	1.5	0
USPI-Lo Rub Black Ink	384	consumed
USPI-Colored Ink	182	consumed

COMPOSITION ROOM

Sprayway-Glass Cleaner		
Alta-RCD-5 Developer	10	5
Alta-RF-5 Fixer	10	5
Alta Chem-RFH Liquid Hardener	1	.5

PHOTOGRAPHY ROOM

TKO Chem- Orbit Bath	.5	.5
Kodak-Photo-Flo 200	2	2
Kodak-Rapid Fixer Part A	6	6
Kodak-Rapid Fixer Part B	6	6
Kodak-SII Activator	2.5	1.25
Kodak-SII Deactivator	2.5	1.25
Kodak-Dektol Developer	5	5
Kodak-D-76 Developer	20	20
Acufine- Developer	5	5
Alta Chem-DD-2.5 Developer	2.5	2.5
Hurst-Processor Cleaner	1 qt	1 qt

Kodak-Film Cleaner	neg.	neg.

CIRCULATION

Amer Sten--Sure-Rite Duplicator Fluid	1 qt	1 qt
	TOTAL	125 gals

Liquid Waste

8.4 lbs/gal
2.2 lbs/kg

(125 X 8.4) / 2.2 = 478 kg/month

Blanket Wash Towels

Use 20 lbs of towels / month
Use 13 gals of blanket wash /month

(20/2.2) = 8.6 kg/month

PHOTOGRAPHIC PROCESS QUANTITY

162 SQ FT--Typeset Paper

45 Sq Ft--Page Film

.5 Sq Ft--35 mm

11 Sq Ft--PMT Room 8X10

8 Sq Ft--PMT Room 11X14

8.5 Sq Ft--TP6 8X10

20.5 Sq Ft--TP6 11X14

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255 Sq Ft of Photographic Material Processed Per day

**** Does not come close to the 1,600 Sq Ft Minimum Per day for requirement of 40 CFR 459

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2. Campbell, M.E. and Glen, W.M., Profit from Pollution Prevention, Pollution Probe Foundation, Canada, 1982.

3. Environmental Quality Council, Right-To-Know: A Guide to Montana's Employee & Community Hazardous Chemical Information Act, Montana Legislative Council, Montana, 1985.

4. J.J. Keller & Associates, Hazardous Communication Guide, J.J. Keller & Associates, Wisconsin, 1986.

5. J.J. Keller & Associates, Right-To-Know Training Kit, J.J. Keller Associates, Wisconsin, 1986.

6. Montana Legislature, Montana Code Annotated 1985: Health, Social Services, Transportation & Utilities, Titles 50-69, Montana Legislative Council, Montana, 1985.

7. Office of Federal Register National Archives & Records Service, Code of Federal Regulation: 29 Labor, U.S. Government Printing Office, Washington, D.C., 1985.

8. Office of Federal Register National Archives & Records Service, Code of Federal Regulation: 40 Protection of the Environment, U.S. Government Printing Office, Washington, D.C., 1984.

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